THE IRON AGE

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MARCH 7, 1935

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Judge Nields Points the Way

IN no field is there such a wide disparity between theory and practice as in the field of social relations. But so long as man remains rational new conceptions of social organization will gain a hearing and, in times of serious maladjustment, will be tried out.

One of the legacies of the stock market crash was the idea that consumption had failed to keep abreast of production. And the reason assigned for this lag was that wages had not risen high enough in relation to prices and profits. Once these premises were accepted, it was natural to assume that something should be done to insure the wage earner a larger share in the fruits of production. This line of reasoning accounts for the political pressure that accumulated behind the idea of collective bargaining and forced the inclusion of Section 7-a in the National Industrial Recovery Act.

Experience under this provision has been most trying. Though many employers, in good faith, encouraged the establishment of representation plans as a means for employees to express their collective will, unrelieved industrial turmoil has been the lot of the country. This unrest, evidenced by an epidemic of strikes and threats of strikes, has not originated among employees. It has been fomented by professional labor leaders who have attempted to fasten their rule on all non-union workers. All of the arts of mob psychology have been practiced to drive unorganized groups into the fold. Moral suasion and coercion in its most objectionable forms have been freely utilized.

But this period of tribulation has not been without its gains. The general public has learned a lesson. Even those who still assume that labor has been under the domination of employers can see no advantage in its passing under the domination of professional leaders. The public is beginning to recognize that collective bargaining and collective obedience to men who are neither employees nor employers are not identical.

The decision of Federal Judge Nields in the Weirton case is therefore well timed. In declaring Section 7-a unconstitutional he points the way to the nullification of a legislative provision that has fallen greatly in popular esteem. Though months may elapse before this decision has been passed upon by higher courts, there is now good reason to hope for the ultimate end of a costly lesson in social experimentation.

G. L. LACHER

Managing Editor, The Iron Age

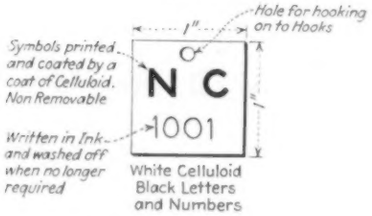
Army Method Applied to

THE author took a leaf out of his book of army experience in the World War and devised a production control system based upon a simple military principle.

WHEN the writer served in the engineers of the A.E.F. he was required to develop the topographical maps employed by division generals in keeping track of the movements of the various regiments and companies of the divisions.

To do this, celluloid thumb tacks were employed, with the company or regiment number on its face.

FIG. 3


Hole for hooking on to Hooks
1"
Symbols printed and coated by a coat of Celluloid. Non Removable
N C
1001
1"
Written in Ink and washed off when no longer required
White Celluloid Black Letters and Numbers

CELLULOID tags, perforated to hang upon hooks on the department wall boards, are used to reveal the nature of individual delays.

These were stuck into a board upon which the map was fastened. As the positions changed the tacks were moved to new positions.

Each day the staff photographer took a photograph of the map. To this photograph was appended, on the back, the date and any terse notes which would give a clue to the reason for interferences which prevented companies or regiments from gaining their objective for that day. These photographs were bound in a suitable bindery and together gave a pictorial history of the progress made daily for the entire period of the division's participation in the war.

A year or so ago the author employed this same method for a special machine and contract metal stamping manufacturer in the Middle West. He termed it the "Visual Production Interference Method," because the entire method was based upon the theory that production units will flow steadily from the raw material sources to the finished stores room if certain conditions or actions do not interfere. If then these conditions or actions, or interferences can be attested and eliminated the flow of production will continue at a maximum rate of speed per unit of working time.

The final form in which this method was employed is shown in the accompanying drawings.

Listing Hindering Conditions

To start with, a list was drawn up of all the possible conditions which could be found that would hinder the continuous flow of production. Opposite each one of these conditions was placed one or two symbolic letters, denoting the particular type of interference. Particular care was taken not to have

FIG. 1

N.C. 1001	No Castings in Stock	A.As	Awaiting Assembly
N.M. 1268	No Material in Stock	A.T.	Awaiting Test
N.T. 976	No Tools on Hand	A.Ex	Awaiting Completion of Experimental Parts
N.D.	No Drawings on Hand	A.I.	Awaiting Inspection
I.M.C.	Insufficient Machining Capacity	L.H.	Lack of Help
B.D.	Break Down	A.	Accidents
→	Awaiting Transportation	A.S.	Awaiting Shipping
T.R.	Tools in Repair	A.U.	Awaiting Unloading
T.C.	Tools being Changed	N.P.	No Power
E.C.	Engineering Change	N.L.	No Lights
P.H.	Production Order Held-Up	C.C.	Customer's Change
P.S.	Parts Spoiled	O.C.	Order Cancelled Awaiting Disposition
F.S.	For Finished Stores Room	A.Pa	Awaiting Packing
		A.Pr	Awaiting Processing

THE first thing to do is to list all possible sources of interferences and give each one a symbol. Here are those listed by the author.

Production Control

By JOHN A. HONNEGER

This principle is that nothing can go wrong with general plans if all of the details go right. The point is to spot the interferences, bring them to light and correct them.

the symbolic letters of any two interferences alike. The list as finally worked out is shown in Fig. 1.

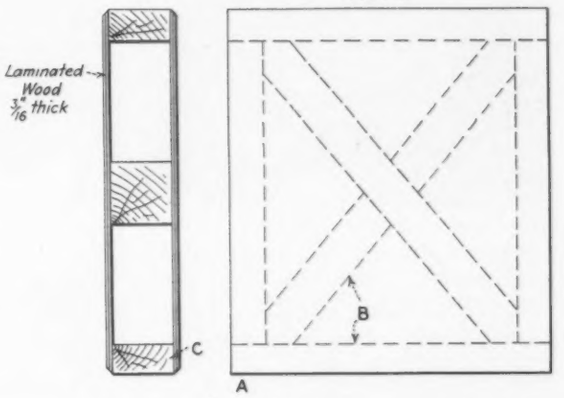
A wall board like that shown in (A), Fig. 2, was then constructed for each department in the organization. The size of the boards was 4x6 feet. The frames (B) were made of white pine, to either side of which was fastened the laminated wood sheets (C).

The next step was to make an enlarged drawing of each department to a scale which would fill the above board. Upon this drawing was shown the actual position of each machine, bench or desk, as well as the aisles, doors, etc. These layouts were then glued to the board and shellacked, after which small brass hooks were screwed into the board at each machine or bench. If the space allowed, as many hooks as possible were inserted, but the minimum number allowed was three. One for the job in the machine, one for the job awaiting processing and one for a job awaiting removal to the next station of production. The spacing of the hooks was so arranged as to allow a one in. sq. white celluloid tag to be hung on the hooks. This tag is shown in Fig. 3.

A Swinging Wall Board

As both sides of the boards were employed it was found necessary to devise some arrangement which would make them easily accessible from either side. To do this pivot straps were fastened to the upper and lower edge of one side of the boards as shown at (A), Fig. 4. The boards were then set into a wall bracket by the pivots, thus swinging on them like a shutter or like the common display boards seen in many merchandising establishments.

FIG. 2



A SIMPLE swinging wall board was made for each department as the basis for operations.

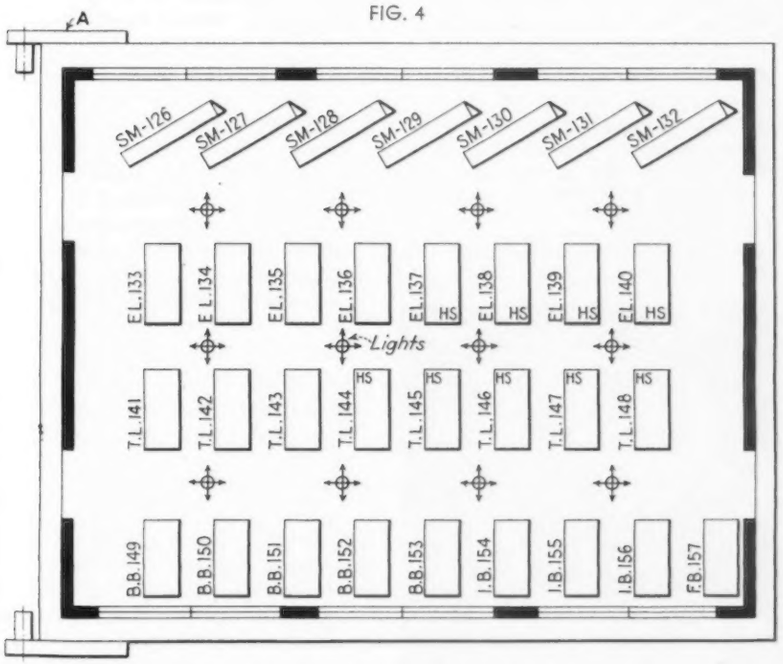
A clerk who constantly received reports from the various departments moved the various celluloid tags around on the boards as required, or added the order number to new tags if new interferences arose.

Every day a photograph was taken of the various boards and these were bound up in book form.

In addition to the above, a simple progress chart was kept. The vertical columns of this chart represented the various departments while a column at the left gave

(CONTINUED ON PAGE 71)

FIG. 4



THE background of each wall board is a scale lay-out of machine arrangement of the department. Hooks are provided for hanging celluloid tags wherever required.

DOWMETAL gondolas have been used in all three successful stratospheric flights made in this country. A new gondola, 9 ft. in diameter, is being constructed for the National Geographic Society—Army flight next summer when Captain A. W. Stevens (left) and Captain Orville Anderson (right) will constitute the flight personnel. Major W. E. Kepner (center) will act in an advisory capacity.

o o o

DIE castings made of magnesium alloys. Most die castings are manufactured by the press-cast method. A roughly measured quantity of molten metal is poured into a cylinder over a ram, which is actuated, after closure of the dies, either hydraulically or pneumatically to produce a pressure of 4000 to 5000 lb. per sq. in. on the molten metal.

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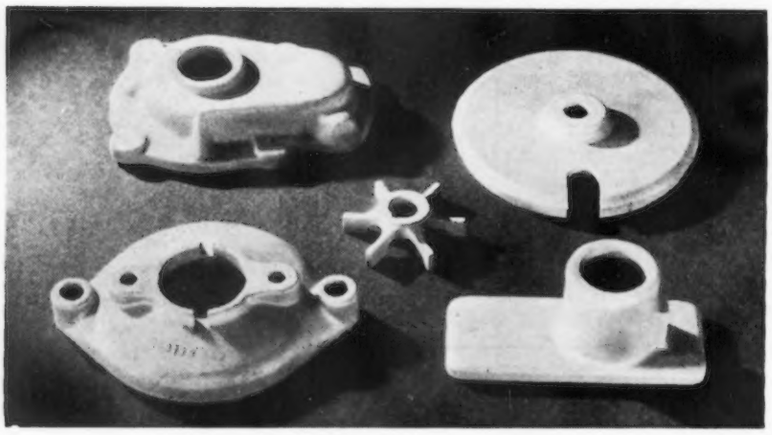

Fabrication

THERE has been a large and continuous increase in the last few years in the application of magnesium alloys, widely known throughout the country under the name of Dowmetal. The metallic magnesium used as the base for these alloys is produced by the electrolysis of a molten salt mixture containing magnesium chloride. This material is secured by chemical treatment from the natural brines underlying central Michigan, which are extensively used in the manufacture of hundreds of other products as well as of magnesium alloys.

Molten magnesium metal from the cells is cast into ingots usually weighing about 14 lb. In this form it analyzes 99.9 per cent pure and is sold largely for metallurgical applications. Used in aluminum alloys in amounts up to 10 per cent, it appears to be an important and necessary constituent. In much smaller percentages it is employed in the refining of nickel and other metals as a degasifier and deoxidizer. Turned into shavings, a considerable quantity is used in organic synthesis for the production of perfumes and fine chemicals.

Interesting as these applications are, it is probable that the greatest potential development lies in the field of magnesium base alloys. Here the combination of good strength, easy machineability and light weight (two-thirds that of aluminum and less than one-quarter that of steel) permit the engineer to reduce dead weight with safety and to increase production and pay loads. The various

and Uses of Magnesium Alloys

o o o

By A. W. WINSTON
The Dow Chemical Co.

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MAGNESIUM alloys, because of their lightness and strength, are constantly being more widely used. In the accompanying article the author describes the manufacture from this non-ferrous metal of sand castings, die castings, extruded shapes, forgings and sheet stock and tells about their various applications. He also deals with the special treatment given the surface of the metal and the method of painting it to get the most satisfactory results in service.

magnesium alloys are designed to meet a wide range of requirements, covering sand castings, die castings, extruded shapes, forgings and sheet.

In the manufacture of these alloys, the magnesium and the alloying constituents are melted together, either under a protecting cover of flux in an open pot or in a closed pot with an inert atmosphere to prevent oxidation. After mixing thoroughly, the molten metal is cast into ingots for remelting or into extrusion billets.

Sand Castings

Magnesium alloy sand castings are made by the usual methods in either dry or green sand molds. The sand should contain a small amount of protecting agent to prevent surface pitting of the casting by oxidation. Satisfactory materials for this purpose generally include sulphur, boric acid, glycol, or various ammonium salts. Shrinkage allowance on patterns varies from 5/32 to 3/16 in. per ft., depending upon the size of the casting and whether or not the shrinkage is restrained by internal cores or bosses. Molding practice is not widely different from that for the casting of aluminum, and good molders have no trouble in picking up the few special methods. The foundry melting equipment is smaller but otherwise similar to that used for alloying. The pouring of small castings from an open pot is done with special hand ladles which are filled by being dipped into the molten metal after skimming back the thin film of protecting flux.

Magnesium alloy castings have average test bar strengths of 23,000 to 27,000 lb. per sq. in., with elongations of 3 to 7 per cent. Depending on the alloy and the treatment, these values may be raised by heat treatment to 37,000 to 42,000 lb. per sq. in., with from 3 to 7 per cent elongation. As these high strengths are secured without sacrificing the lightness of magnesium, it naturally follows that applications for these alloys are widening.

With its emphasis on light weight, the aircraft industry extensively uses magnesium alloy castings for motor and starter parts, structural brackets, air scoops and ventilators and aircraft wheels. Motor cases, handles and nose-pieces of portable tools likewise are being cast. In addition to applications where light weight is essential, these castings are gaining a competitive footing in other fields, where economy may be the deciding factor.

Machining

Magnesium alloys are machined with ease, the low cost of machining frequently more than offsetting the possibly slightly higher cost of the castings themselves. The material is free cutting, with a short chip and little tendency to heat up, drag or tear. Tools must be honed to a sharp edge and kept that way. Little top rake is needed, but there should be plenty of side clearance to avoid friction. In high speed screw machine operations, where fine shavings are produced, a soluble oil coolant is desirable. Ordinarily, however, cutting is done dry without risk of fire. If a fire should start in the chips due to neglect of the tools, it may be smothered with cast iron borings, powdered graphite, salt or sand. Liquid extinguishers or water should not be used, as they will spread the fire.

Die Castings

During the last two years, considerable progress has been made in adapting die casting processes to magnesium alloys. The usual pneumatic or plunger machine of the goose-neck type has proved too difficult to operate and maintain, having been abandoned in favor of the press-cast method. In the latter, a roughly measured quantity of molten metal is poured into a cylinder over a ram, which is ac-

tuated, after closure of the dies, either hydraulically or pneumatically to produce a pressure of 4000 to 5000 lb. per sq. in. on the molten metal. Compared with castings made by the older process under one-tenth of this pressure, there is a substantial improvement in soundness and in surface finish. Typewriter and small portable tool parts are now being made satisfactorily in this way. In fact, the field for die castings is just beginning to open up.

Extruded Shapes

Manufacture of bar stock and structural sections is entirely by extrusion. The rolling of these shapes is not commercially practical at this time because of small production and the high cost of the equipment required. By contrast, a variety of shapes can be turned out at a reasonable cost by the extrusion process, using cheap dies. The extrusion is done between 600 and 850 deg. F., preferably at as low a temperature as possible because better properties are obtained thereby. With certain thin sections, however, the enormous billet pressures necessitate extrusion at higher temperatures, at which the magnesium alloy is more plastic.

A fairly complete range of structural sections is now available, including bars, angles, channels, I-beams, and special shapes up to about nine inches in maximum cross-section dimension. The maximum lengths are dependent upon the size of the billet used for the particular section, and usually will not be less than 40 or 50 ft.

Tubing is also extruded, a hollow billet being placed over a mandrel which is anchored at the back end in the dummy block and ram while the front end projects through the die, leaving an annular opening through which the extrusion takes place. The lengths are more limited than in the solid sections due to the short billets which must be employed.

Properties of extruded shapes vary somewhat with the alloy and the section, running the highest in A alloy bar stock where values of 45,000 to 50,000 lb. per sq. in. are obtained. These figures compare favorably on a weight basis with those of strong aluminum alloys, which, though, possessing greater strength, are 50 per cent heavier. In transverse bending, if the thickness is increased 20 per cent over the aluminum section, equal strength will result with a 25 per cent saving in weight. Extruded magnesium alloy shapes are finding their most promising application in the structural framing of truck and trailer bodies, where their use makes possible the reduction of body weights to new low figures.

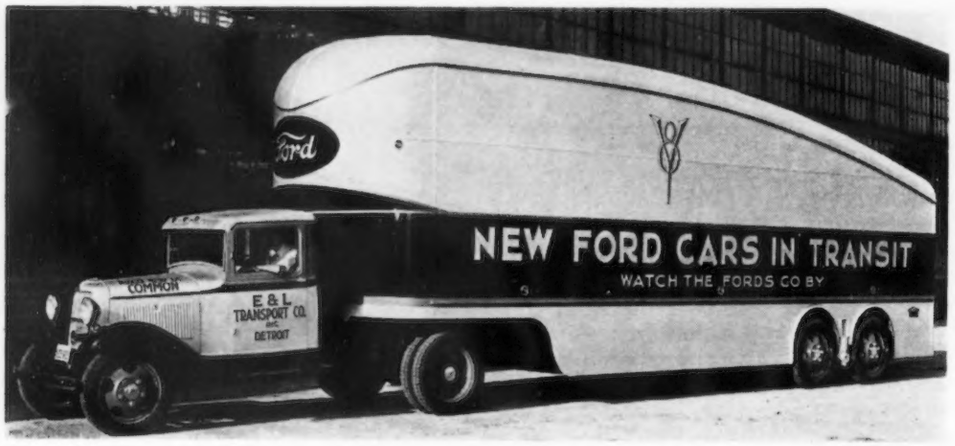
Forgings

During the last few years a number of forging applications have been developed, the most important being a resonator disk for automobile horns. Several millions of these disks have been made by automatic coining from a heated strip of extruded stock. The peculiar resonance of the disk rather than light weight has been the deciding factor in choosing magnesium alloys. Light weight, however, is important in bearing caps, of which many have been forged for airplane motors.

Two alloys are available in rolled sheet, Dowmetal M containing about 1.5 per cent manganese and Dowmetal F with 4 per cent aluminum and 0.3 per cent manganese. The latter has the better mechanical properties and is equivalent to alloy M in ordinary atmospheric exposure, but is surpassed by it in resistance to salt water. Sheet is rolled from extruded slabs which are better and cheaper than cast slabs. A reduction of about 50 per cent takes place during extrusion, resulting in a breakdown of the cast structure. When this same initial reduction is accomplished by rolling cast metal, the slabs must be handled carefully with small reduction per pass to avoid cracking.

Sheet metal is used principally for panels in trucks and trailers. Some material goes into aircraft construction, but the tonnage is not large. On account of the work-hardening characteristic fundamental to magnesium base alloys, few uses have developed for sheet metal where deep drawing, spinning, or bending too sharp corners is required. Where these operations are necessary, heating of the stock and tools may be required if the deformation is severe.

A recent interesting application of sheet metal has been in the construction of stratosphere flight equipment, Dowmetal gondolas having been used in all three of the successful flights made to date in this country. Another gondola, nine feet in diameter, is now under construction for the second National Geographic Society-Army Air Corps flight scheduled for next summer. The shell, floor, shelving, suspension cradle, and other aux-



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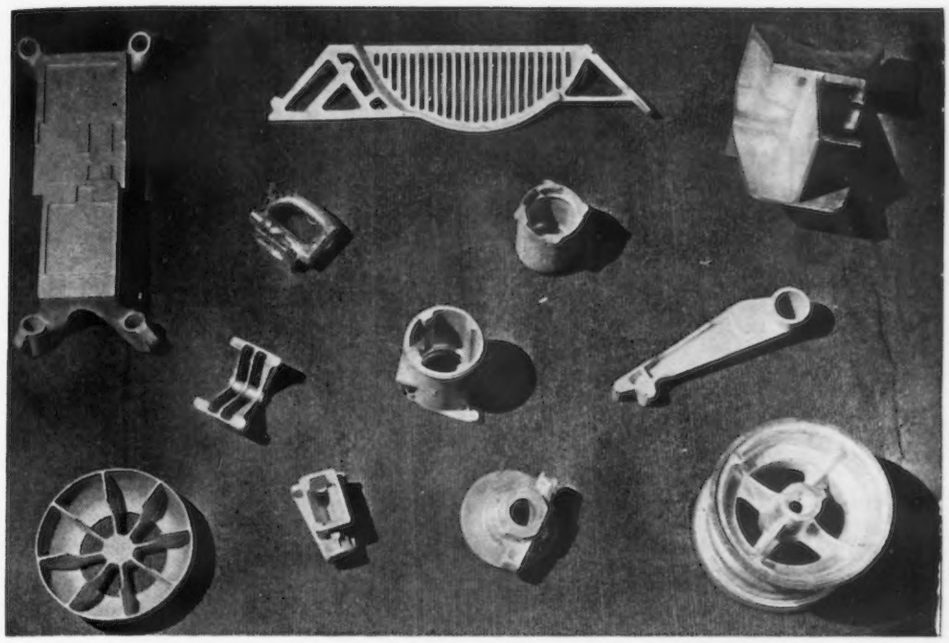
TOTALLY-IN-CLOSED trailers for transportation of Ford cars from factory to dealer are built of Dowmetal. Sheet stock is used for panels and extruded shapes in the structural framing.

o o o



A FEW of the variety of products cast from magnesium alloys are shown above and at right.

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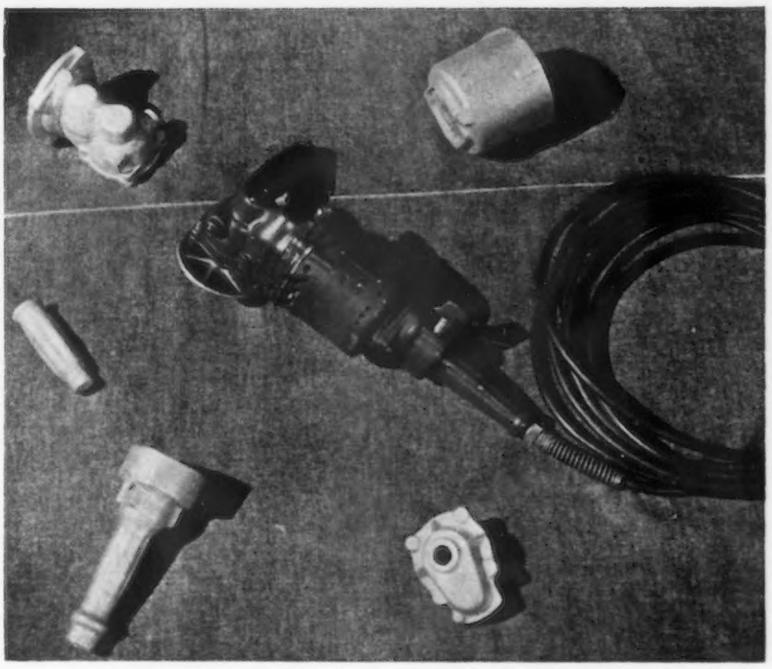


iliary parts, as in the other gondolas, will be built of Dowmetal.

Welding and Riveting

Sections of the gondola shell are joined by oxyacetylene welding. The process does not differ from that for other metals except that, as in foundry practice, a flux must be used to keep the molten metal from oxidizing. If care is exercised during and after welding to prevent residual flux contamination, no trouble will be experienced later from corrosion. Electric spot welding and butt welding have been successful experimentally, but are not employed commercially to any great extent at this time. Structures such as trailers are generally assembled with aluminum alloy rivets. Magnesium rivets could be used hot, but work-harden too fast to be used cold.

Corrosion

Corrosion of magnesium alloys formerly caused much concern, which largely has been eliminated through alloy development, adequate paint protection, and the exercise of judgment in their application. The bare metal is remarkably resistant to ordinary weathering where there is good ventilation. In a number of instances, completely unprotected parts have been exposed to the weather for several years, with a graying of the surface as the only result. In humid locations, especially near the sea coast, the darkening is accompanied by a roughening of the surface, and some protection becomes desirable. This is best accomplished with a properly designed paint system.

Before it is painted, the surface of the metal should be chemically treated to promote lasting adhesion of the paint. The treatment best suited for the purpose is called "chrome-pickle" and consists of a dip in a room-temperature solution of nitric acid and sodium dichromate for 30 to 60 seconds. When properly applied, it gives the surface a matte etch which provides a satisfactory "tooth" to hold the paint and retains a thin film of chromate compound, thus imparting to the metal a considerable degree of corrosion resistance. Chrome-pickle has been adopted as the standard plant finish for all forms of Dowmetal from castings to sheet because of this latter consideration and because of the pleasing uniform bronze appearance.

In the choice of a paint system, special care should be given the primer which by test must have been proved satisfactory. Permanently good adhesion is the most important factor. This is most readily secured through the use

DOWMETAL ALLOYS—CHEMICAL COMPOSITION AND USES

Alloy	Nominal Composition: Aluminum	Manganese	Zinc	Magnesium	Average Properties: Yield Strength, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent	Principal Uses
A	8.0	0.2	..	Balance	12,000	26,000	5.0 (cast)	Sand castings. Heat treatment not required for general use. Heat treated for highly stressed parts requiring good impact toughness. Certain special extruded shapes.
					12,000	34,000	10.0 (HT 1)	
					34,000	47,000	13.0 (extr'd)	
G	10.0	0.1	..	Balance	13,000	23,000	2.0	Die castings. Heat treated sand castings requiring high yield strength with moderate impact toughness.
					13,000	33,000	8.0 (HT 1)	
					19,000	34,000	2.0 (HT 3)	
B	12.0	0.1	..	Balance	16,000	21,000	1.0	Heat treated sand castings requiring maximum yield strength and hardness.
					22,000	30,000	0.5 (HT 3)	Impact toughness is relatively low.
H	6.0	0.2	3.0	Balance	12,000	27,000	6.0	Sand castings with improved salt water corrosion resistance. May be heat treated to secure high yield and ultimate strengths with good impact toughness.
					12,000	36,000	11.0 (HT 1a)	
					19,000	39,000	5.0 (HT 3a)	
F	4.0	0.3	..	Balance	29,000	40,000	16	Forgings, sheet, and plate, extruded shapes, bars, rods, and tubes.
J	6.5	0.2	0.75	Balance	30,000	43,000	18.0	Forgings, bars, and rods. Certain special extruded shapes.
M	...	1.5	..	Balance	27,000	42,000	7.0	Sheet, plate, and rod for moderately stressed parts requiring resistance to salt water.

NOTES—Properties of wrought forms are the average for extruded round and square up to 1½ in.
Yield Strength is the stress at which the stress-strain curve deviates 0.2 per cent from the Modulus line.
(HT 1)—Solution heat treated. (HT 3)—Solution heat treated and aged.
(HT 1a)—Solution heat treated. (HT 3a)—Solution heat treated and aged.

of material based on certain synthetic resins or specially processed oils. A surfacer coat between the primer and top coats will do much to improve the imperviousness and durability of the job. A minimum of two finish coats of a weather-resistant enamel should be applied. Where possible, small parts should be given baked finishes, which have been proved superior to air-dried products. Where magnesium alloys are used under definitely corrosive conditions, such as in or near salt water, it may be desirable to add zinc chromate, an inhibitive pigment, to the primer. For this service the vehicle for all coats should be water resistant, a condition best met by varnishes based on tung oil and a phenol resin.

When care is exercised in the whole painting program, from the chemical treatment to the finish coat, a satisfactory job should result, limited in its life only by the durability of the paint products themselves under the particular exposure conditions. The magnesium alloy will remain intact, and after the original paint has begun to fail, may be repainted when necessary to continue indefinitely in the service intended.

As engineers become more familiar with weight saving possibilities of magnesium alloys, we may expect a large expansion in their uses, reaching into fields unknown at the present time. In some competitive applications, there may be overlapping with other established materials, but we probably will see increasing amounts specified in locations for which they are particularly adapted by their lightness and strength.

Steel Industry Is Widely Distributed

IN more than 250 communities, scattered from Maine to California and from Minnesota to Texas, some phase of the steel industry is an important economic factor. According to the American Iron and Steel Institute, steel products covered by the steel code are manufactured in 433 different plants strategically located with respect to raw materials or markets.

The aggregate population of these cities and towns which have some part of the steel industry totaled 22,000,000 at the 1930 census. Employees of the steel industry and their families, therefore, constitute approximately 10 per cent of the total population of the steel-making districts.

With an aggregate investment of nearly $5,000,000,000 and with more than 400,000 employees, steel ranks in many of those communities as the principal industry. Payrolls amounting to more than $455,000,000 were distributed in steel towns during 1934, while the industry annually pays an estimated $80,000,000 in taxes to Federal, State and local governments.

The greatest concentration of the industry, as might be expected, is in the leading industrial states. Pennsylvania leads with 130 plants making code steel products, while Ohio, with 87 plants, ranks second. Illinois, New York and Indiana follow in succession. Alabama, Michigan, New Jersey and West Virginia each have 15 plants.

Making Measuring Cups From Stainless Bar Stock

By ROGERS A. FISKE
Western Editor, The Iron Age

THE use of stainless steel in products requiring machining operations is making considerable headway. An instance of this is the manufacture of measuring cups which are used in dispensing fruit juices. Here, the acid resisting properties of stainless afford considerable advantage.

This article describes the experience of the Liquid Carbonic Corpn., Chicago, which has recently adopted stainless bar stock for the manufacture of measuring cups.

FRUIT acids have always introduced a problem when brought in contact with metal. Manufacturers of equipment in the food industries are therefore in constant search for metals that will more fully serve their purposes. Despite its additional cost the use of stainless steel is making rapid progress and in many instances its use has required the adoption of new shop practices and in some cases revision of ideas as to how this comparatively new alloy can be worked to best advantage.

The Liquid Carbonic Corpn., Chicago, has recently adopted stainless steel for many parts on its bottling machinery and other equipment. Of special interest is the transition from an acid resistant metal cast in its own foundry to stainless steel for the manufacture of syrup measuring cups. These cups when finished measure 2.062 in. outside diameter and 1 13/16 in. from lip to base. They are drilled and tapped for four screws and the finish must be such that syrup drains freely and quickly, thereby assuring quick and accurate measurement of one ounce or less of a liquid. When mounted in the bottling machine this cup is moved in a vertical line, being first submerged in the syrup and then raised above the syrup level, after which a valve is opened thereby draining the syrup trapped in the cup to the bottle that is being filled.

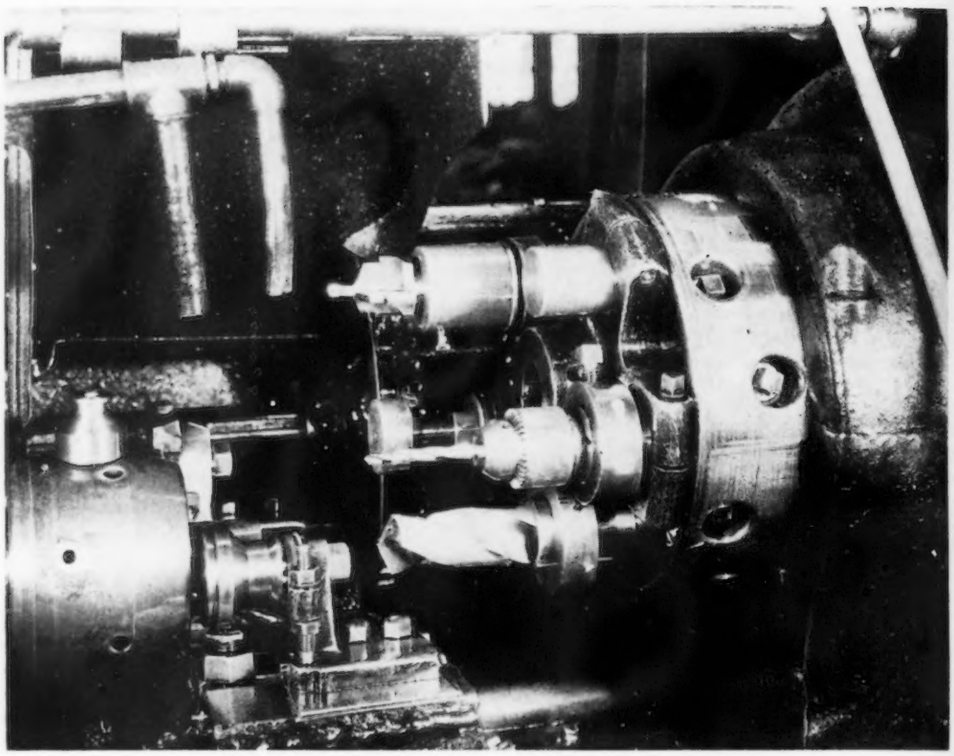
Old Practice Involved Castings

Old practice called for a separate casting for each cup. These were made of 27 per cent nickel-silver in the Liquid Carbonic foundry. It is no reflection on the character of work performed in that foundry to point out that if 85 per cent of the castings sent to the machine shop proved satisfactory, the record was considered good. Very often defects that showed up when machining reduced this percentage materially and this one situation alone often accounted for manufacturing delays and added costs that were troublesome.

The method of manufacture when using castings was as follows. A casting was mounted in a three-jaw chuck in a turret lathe. It was first rough faced, then rough bored and then the outside large diameter was rough turned. Then a gang combination tool was used to finish bore and to get the proper slope of the inside of the bottom of the cup. Next, the finish cut was taken on the outside of the large diameter after which a 15/32-in.

hole was drilled through the axis of the cup to serve as a drain.

The casting was then removed from the turret lathe and mounted on a mandrel which had a tapered shoulder to fit snugly into the bottom of the cup. The mandrel extended through the 15/32-in. bore and a nut clamped the part against turning. The cup as mounted on the mandrel was turned end for end from its position in the first set-up. The first operation was to cut a deep groove in the outside near the end and then to shape the outside contour of the lower half of the cup. Operations that followed were the same as now practised on stainless steel and will be described later.



THESE cups are now made from stainless steel bars on a Cleveland automatic.

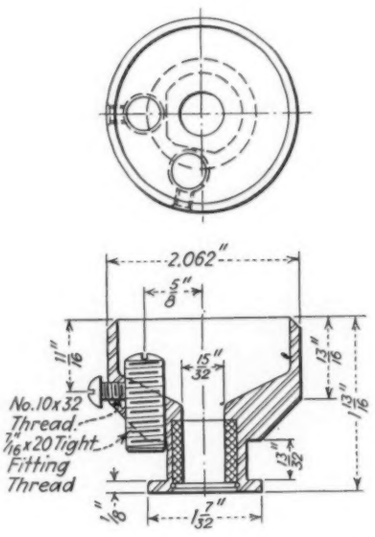
A very significant point is that a comparatively large amount of metal was removed from these castings and much wastage occurred both in labor and metal because of defective castings. In addition, the tools wore rapidly especially when used on the first operations which of necessity included removing the skin of the casting.

Stainless Bar Stock Now Used

When it was determined to make the syrup measuring cups from stainless steel it was decided to order the 18-8 free turning stainless steel in bars 2 1/16 in. in diameter and in lengths of 8 ft. to be used in a 2¾-in. Cleveland automatic.

This shop has been steadily gaining experience in the use of stainless steel. It has found that special attention must be given to tool lubrication. This problem was rather easily solved. A study of tool grinding revealed that in practically all instances standard practice for carbon steels could be followed on stainless steel, at least insofar as grinding in the tool room is concerned.

One of the most important items is finish and the practice was finally adopted of impressing on the machine setter the quality and finish of work required. He is then permitted to touch up his tools on bench grinders in order to obtain the desired results. Often no changes are necessary and such deviations as are made from standard angles are very slight. It is claimed by this shop that this is the most practical way to meet the problem of the slight variations in cutting qualities that often occur in bars taken from different shipments though of the same general specifications. The proof of the efficacy of this practice lies in the very satisfactory results obtained.

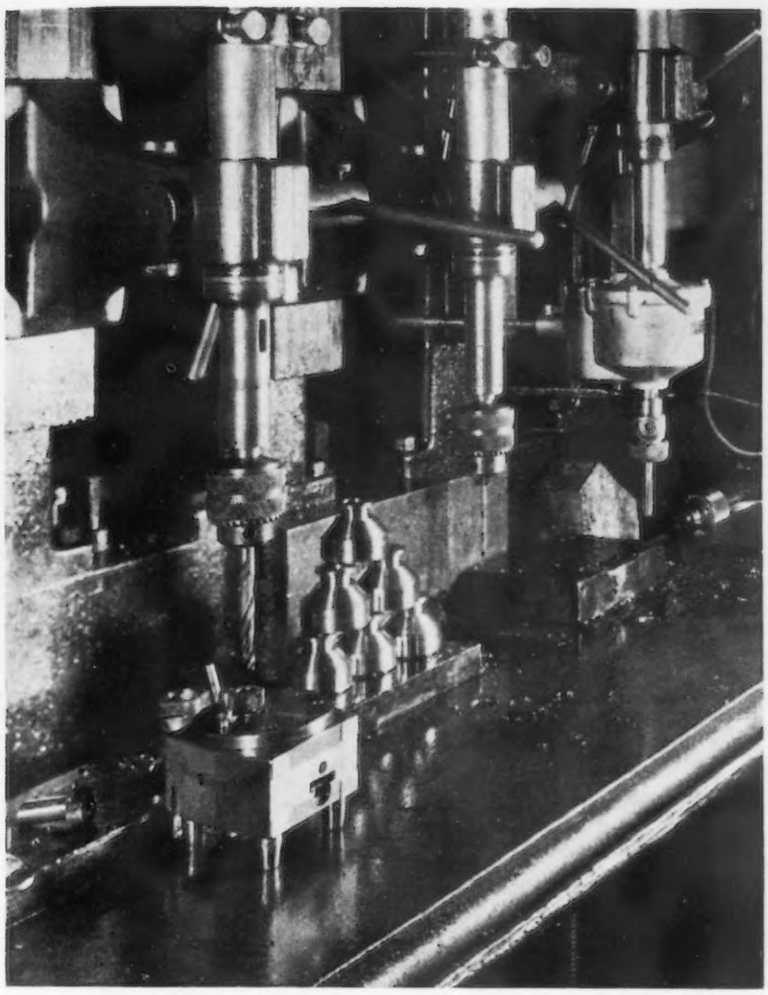


THESE syrup measuring cups were formerly made from individual castings and wastage was costly

Operating Details

The tools used on the stainless stock are all made of Rex 95 high speed steel and the spindle speed is 170 r.p.m. After the initial production is past it is planned to try to increase this spindle speed. The first operation on the automatic is to drill a 1 27/32-in. hole 11/16 in. deep. While this drilling operation is going on, a side tool advances and bevels the upper lip of the cup, turns the outside form and cuts the deep groove near the base of the cup. The second operation is to drill a 13/32-in. hole through the axis of the cup and the third operation makes use of a combination boring tool that finish bores the inside of the cup and forms the inside of the bottom to 24 deg. 58 min. The final operation is cutting off.

The cups are then taken to the drill press department for drilling



FOUR holes are drilled and tapped, the syrup cup being securely held in a box type fixture.

and tapping. Here high speed drills and taps are used, the only special requirement being that the 25/64-in. drill is ground to 82 deg., not because of the metal being used but for the reason that the cup is drilled from the top and the first point of contact between the drill and the cup is on the 24 deg. 58 min. slope of the cup bottom and the sharper angle gives a better initial bite and thereby relieves wear and strain on the fixture.

This fixture is of the box type and is loaded from the bottom, the beveled rim of the cup fitting into a groove in the fixture. This is a light drive fit. A bolt extends through the cup by means of which the cup is held securely in place. Hardened steel plug guides are then inserted in the fixture. The first three operations of drilling and tapping are performed on the first three spindles of a four spindle drill press. Two 25/64-in. holes are first drilled at a spindle speed of 720 r.p.m. At the second spindle, operating at 950 r.p.m., two holes are drilled with a No. 21 drill. The third spindle operates at 380 r.p.m. It is fitted with a tapping head in which is used a 7/16 in. by 20 tap. This tap is not pushed clear to the bottom, the operation being finished by hand because of excessive tap breakage. The small holes are tapped on an R. G. Haskins Co. tapper which is mounted at the end of the drill press.

Final operations are performed in a turret lathe in which cups are held in a three jaw chuck. The 15/32-in. hole is bored to 11/16 in. for a rubber bushing and the end of the cup is here recessed to hold a stainless steel wire spring. The boring tool also faces the end of the cup.

The stainless steel cups are then delivered to the cleaning department where all traces of lubricant are removed and the cups are polished and buffed. Throughout all machining operations tolerances permitted are 1/1000 in. over or under.

The use of stainless steel bars is giving satisfaction, not only because of a superior product from the standpoint of service in fruit acids but also from the viewpoint of wastage of labor and material which have been practically eliminated.

Cost of Material vs. Cost of Treatment

IN the economic balance between cost of materials and cost of treatment the volume of production is frequently the principal factor in determining what process the manufacturer is to choose, according to John L. McCloud, chief of the chemical and metallurgical division of the Henry Ford Engineering Laboratory, who recently addressed the Chicago chapter of the American Society for Metals.

In covering his subject he discussed treatment cost ratio and he emphasized his point by declaring that it would be entirely possible, technically, to make almost every part of a modern automobile of plain carbon steel, by giving close attention to the carbon content and subjecting the part to appropriate heat treatment. Many heat treating installations at the Ford plant have been designed for single parts, an example being the machine for quenching camshafts which, while being rapidly rotated, are carried past quenching jets so arranged that the most drastic quenching takes place only on the load bearing portion of the shaft, that is the cams and the bearings.

Present status of welding in ship construction is the topic of a meeting of the New York section of the American Welding Society, to be held on the evening of March 12, at the Engineering Societies Building. Lieut. Commander J. D. Crecca, United States Navy, will speak on "Use of Welding On Naval Work," and J. L. Wilson, assistant chief surveyor, American Bureau of Shipping, will discuss "Merchant Ship Construction." S. S. Scott, senior welding engineer, Navy Yary, Brooklyn, N. Y., will preside.

FIG. 1—Grinding the face of a lamination die.

Diversified Grind ing In Tool Ro

THIS article illustrates and describes a number of grinding operations performed in the tool room of the Lincoln Electric Co., Cleveland. The company's product is electric motors in various sizes from 1 to 50

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By FRED B. JACOBS

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GRINDING operations practiced in tool rooms devoted to accurate work will vary greatly in different plants. In a tool room dealing particularly with the manufacture of jigs and special tools there will be found a variety of surface and cylindrical grinding operations. If the products are small tools, such as reamers, counterbores, spot face tools, etc., cylindrical grinding will predominate. If many milling machines are in operation in the plant, cutter making and sharpening work will keep a number of men employed. Where metal stampings enter into the product, die making and die grinding operations will be carried on constantly.

Steel armature laminations are made in large quantities at the plant under discussion and are blanked between compound dies generally, although in some instances plain blanking dies are used. Some of the larger laminations are notched. That is, the slots to accommodate the armature windings are punched one at a time, the disk being spaced accurately, notch to notch, as each notch is punched. Regardless of what type of dies are used, they must be kept in first class working condition at all times, which necessitates sharpening at frequent intervals.

The operation shown in Fig. 1 consists of grinding the face of the lower member of an armature lamination die. The machine used is a Gallmeyer & Livingston hydraulically operated surface grinder, capable of taking work

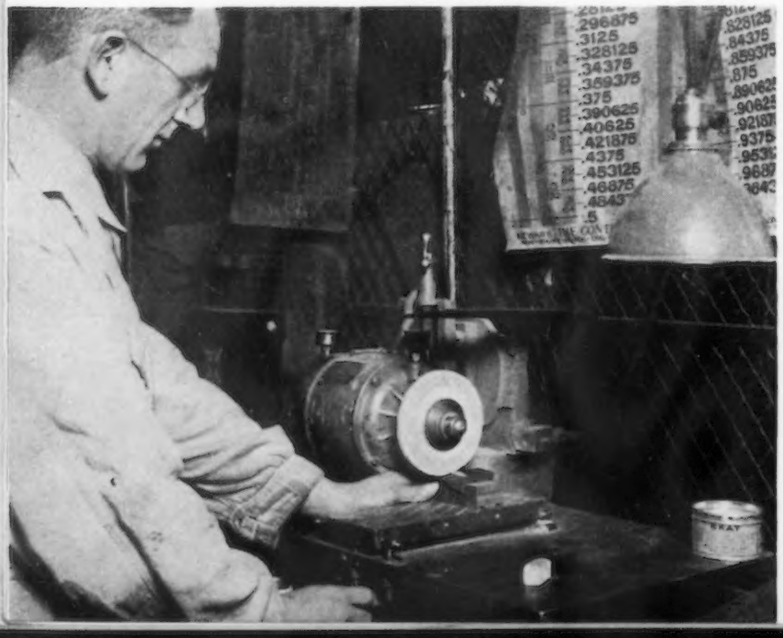

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FIG. 3—A simple arrangement for miscellaneous hand grinding.

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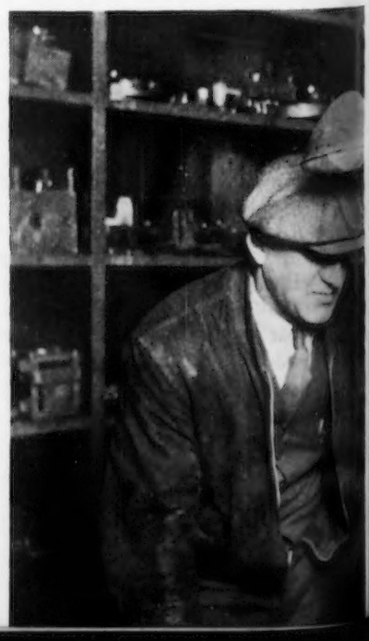

ing Operations
Room Work

horsepower and electric arc welding equipment. As a large battery of punch presses is in constant operation, die making and die grinding operations are going on continually.

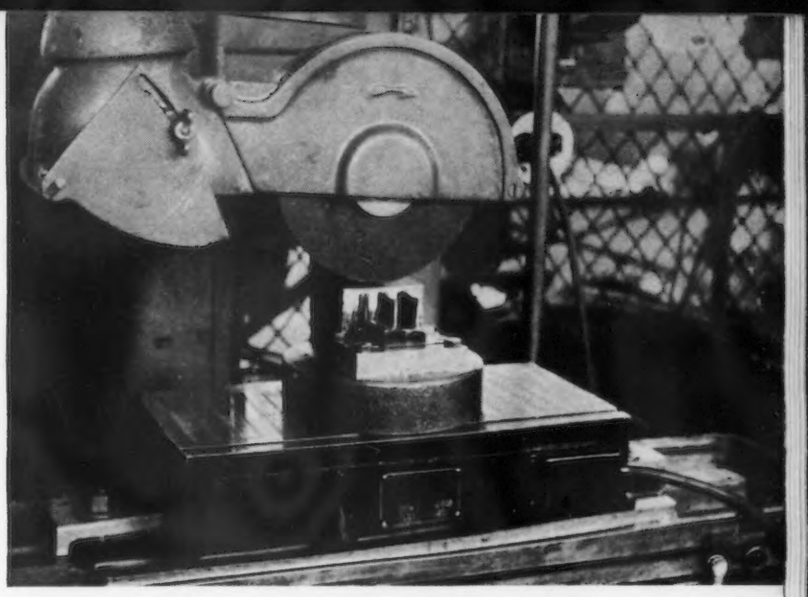

FIG. 2—Hole in magnetic chuck permits grinding of shanked punches.

13½ in. wide and 36 in. long. The grinding wheel spindle is directly driven by a 3 hp. motor operating at 1800 r.p.m. As the wheel is 12 in. in diameter the surface speed is slightly in excess of 5600 ft. per min., that is when the wheel is new and consequently up to size. When the wheel has worn to a diameter of 10 in. the peripheral speed drops to 4700 ft. per min. With the machine in question, any wheel speed within the above range or even slower will give good results inasmuch as the table travel can be adjusted from practically nothing to 100 surface ft. per min. The wheel used on this machine is Alundum, 12 in. in diameter, 2 in. face 3846 grit, J grade. The grinding operation generally is performed wet.

The die in position for grinding is a comparatively small unit as it is only 8 in. in diameter. It is strapped directly to the platen by a bolt through the ears at each end. A location of this kind is used when the die surface must be flat. In many instances, however, the die face must be sheared, that is higher at the center than at the sides, so that the die will cut the metal with a shearing action. The amount of shear is approximately the thickness of the metal to be punched. In grinding the shear on a die it is shimmed up at one end or side so that its upper surface is at a slight angle with the platen face. Two grinding cuts are necessary, one for each side of the crown where the two angular surfaces meet. In some instances an adjustable grinding fixture is employed which provides means for generating the shear by means of an angular adjustment between the top and bottom members of the fixture.

If the upper or punch member has a flat surface without a shank it is ground in the same manner as the die is ground, although if the die is sheared the punch generally is left flat. However, in many cases the punch is provided with a taper shank to fit the ram of the press. One way to grind such punches is to locate them in a block of cast iron provided with a taper hole to accommodate the shank. Another method is to locate the punch as shown in Fig. 2.

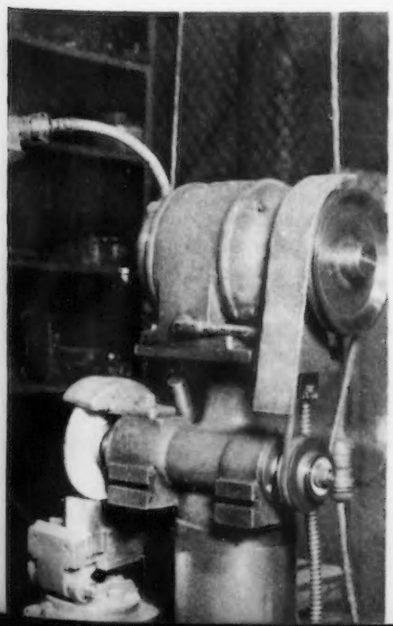

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FIG. 4 — Sharpening wire cutting knives.

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FIG. 5—Internal grinding of armature lamination die in lathe.

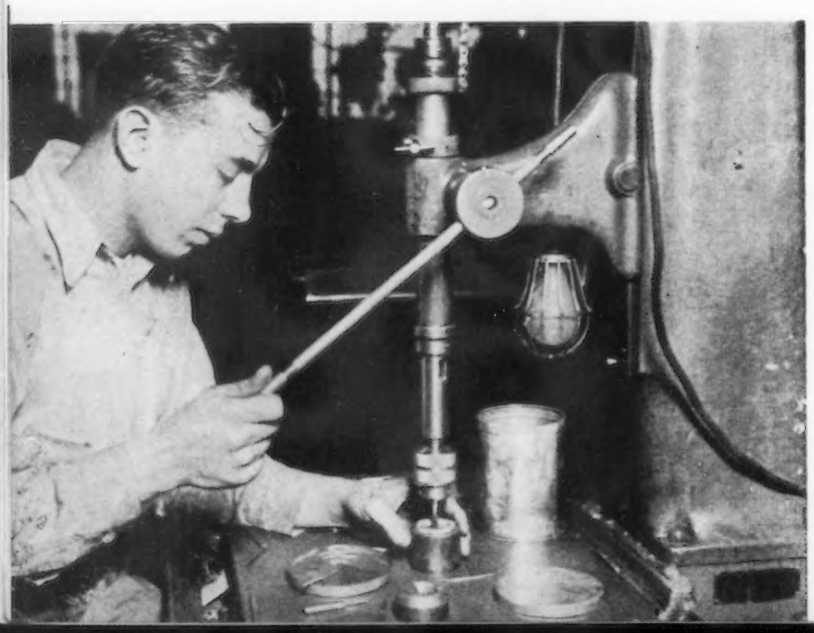
FIG. 6—On heat treated dies, hand grinding replaces laborious stoning.

In this case the magnetic chuck on which the punch is located has a 2-inch hole through it to accommodate the shank. Thus the upper face of the punch holder rests directly on the chuck.

This machine is Brown & Sharpe No. 2 surface grinder fitted with an Alundum wheel 7 in. in diameter, ½ in. face 3846 grit, H grade operated at a normal surface speed of 4000 ft. per min. The chuck is a special unit made by the Osborne Electric Corpn. Aside from being used for grinding punches the machine and chuck in question are employed for a diversity of surface grinding operations such as finishing the parts of sectional dies. The hole does not interfere with ordinary surface grinding operations.

A large number of small parts such as punch and die sections are ground by hand by means of the appliance shown in Fig. 3 which was developed by the Lincoln company's engineers. This device is quite simple and produces accurate work. It is powered by a fractional horsepower motor operating at 2400 r.p.m. The motor is mounted on a bracket which is provided with a vertical adjustment controlled by a screw and hand handle. Under the wheel is the work table which is hinged at the back while the front can be raised or lowered by an adjusting screw. Locking screws are provided at either side of the table front. The table is seriated so that grinding dust does not bank up under the work to cause inaccuracy. The operator holds and guides the work by hand, passing it back and forth under the wheel. First he makes a series of cuts and then turns the work 90 degrees and goes over it again. This operation sometimes is termed spot grinding. The wheel used is Alundum, 6 in. in diameter. ½-in. face, 46 grit, K grade. The surface speed of the wheel is 3770 ft. per min. which is normal for an operation of this kind.

FIG. 7—Lapping the hole in a Carboloy wire drawing die.



In the manufacture of welding electrodes it is necessary to cut a large number of wires of various gage sizes into predetermined lengths. Wire cutting knives are generally high speed steel. They vary in size, but the one shown in position for grinding in Fig. 4 is 2 x 3 x 1 in. The knife is clamped in a universal vise which is set to the necessary angle which usually is 5 deg. The machine used is a Wilmarth & Marmon universal grinder fitted with an Alundum wheel, 6 in. in diameter, ½-in. face, 3846 grit, K5B bond. As the illustration shows, the machine is equipped with an individual electric drive. The wheel speed is approximately 5600 surface ft. per min. While the wheel in question is manufactured alumina it is pure white in color and adapted to work where very cool cutting is essential.

The operation shown in Fig. 5 consists of grinding the inner diameter of a punch for blanking out armature laminations. As the illustration shows, the work is gripped in a four jaw independent chuck in the engine lathe. The work can be located very accurately in this manner as it can be trued up with a dial indicator on both the outer diameter and the face. Grinding is done with a Van Dorn portable grinder mounted on the lathe carriage. This grinder is ½ hp. operating at 3600 r.p.m. As the wheel is 2 in. in diameter its surface speed is approximately 1800 ft. per min. This is a slow surface speed, comparatively speaking, but it is not unusual for an internal grinding operation performed under these conditions. The wheel is Alundum, 2 in. in diameter 1½ in. face, 46 grit, K grade. Due to the low speed of the wheel the grade is somewhat harder than would be necessary if the wheel were operated at somewhere normal speed, or about 5000 surface ft. per min.

In the manufacture of various punch and die units it often is necessary to remove slight amounts after heat treatment. Formerly such operations were generally performed by the laborious method of stoning by hand. An improvement over the hand method is shown in Fig. 6 which shows a Madison Kipp air-operated high-speed grinder in operation. The little wheel is ¼ in. diameter x ¼ in. face and operated at a speed of 40,000 r.p.m. thus imparting a peripheral speed of about 2600 ft. per min. As the illustration shows, the operator holds and guides the wheel by hand and as the exhaust air is expelled at the front of the device, or toward the work, it blows the chips away as fast as they are generated. It is shown that the operator supports the wheel spindle housing with his little finger and in this manner a very sensitive control is assured.

In finishing holes in carboloy wire drawing dies the lapping process is followed as illustrated in Fig. 7. The hole is finished to a diameter of 0.254 in. in this instance. About 0.003 in. is allowed for lapping. The first 0.002 in. is removed with a cold-rolled steel lap charged with No. 150 Carborundum grain, mixed with a high quality of light lubricating oil. Then the work is washed carefully in gasoline to remove all traces of Carborundum and the lapping operation completed with diamond dust and a copper lap. As the illustration shows, the operator holds the work by hand while the lap is held in the chuck of a sensitive drill. Both laps are operated at a speed of 1180 r.p.m. This gives a surface speed to the lap of about 77 ft. per min. which tends to upset the time honored theory that a lap should always be run at a low speed, about 20 ft. per min. However, in this case the results are entirely satisfactory.

Difficult problems often are encountered in the manufacture of comparatively large snap gages due to the fact that ready means are not always at hand for finish grinding them. In Fig. 8 is shown how the problem is solved readily by utilizing a shaper equipped with a Standard Electric tool grinder. The grinder is held in the tool post as the illustration shows and is fitted with an Alundum wheel 6 in. diameter, ½-in. face, 3846 grit, L grade, operated at 3600 r.p.m. The surface speed imparted to the wheel is about 5600 ft. per min.

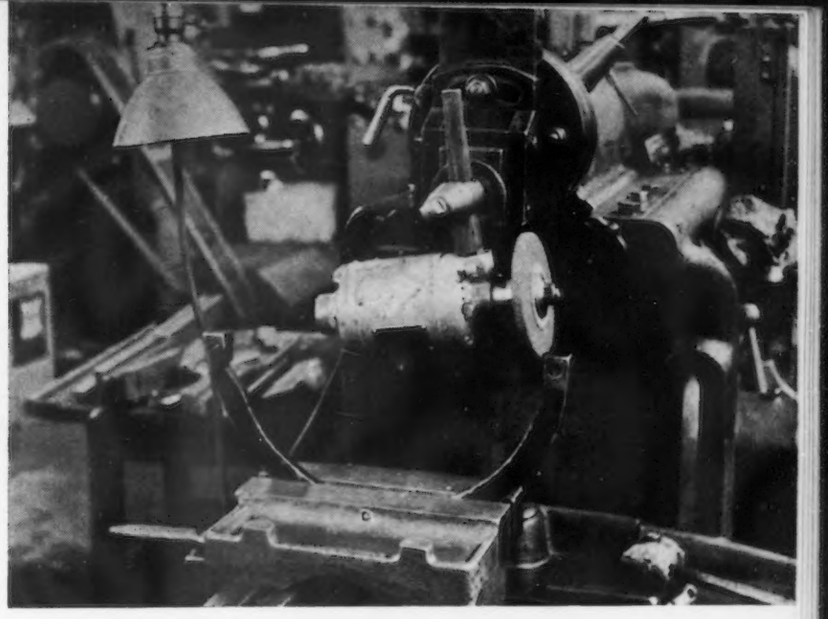


FIG. 8—Shaper and tool grinder combination for finishing snap gages.

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In this operation the grinder is set at a slight angle as the illustration shows so that the corner of the wheel is used for grinding. The shaper ram is operated at a speed of about 25 ft. per min. and the wheel fed down past the work by hand. After one side is finished, the grinder is turned end for end in the tool post and the other side ground. As both surfaces are finished at one setting of the work they will be parallel, which is the condition required.

For sharpening inserted tooth metal cutting saws as shown in Fig. 9 an automatic saw sharpening machine of German make is used. This tool is a product of Gustav Wagner, and is fitted with an Aloxite wheel, saucer shape, 8½ in. in diameter, 46-A grit, N grade, operated at a surface speed of 5000 ft. per min. The saw in position on the machine is 22 in. in diameter. The operation of the machine is entirely automatic and provision is made for controlling the wheel movement to take care of a number of tooth shapes. In operation the wheel drops into the tooth and grinds at the gullet. Then as the wheel is automatically raised a feed pawl advances the saw one tooth. Thus the operation is continuous, it being only necessary for the operator to feed the wheel down a slight amount each time the saw has been gone entirely around.

FIG. 9—Automatic saw sharpening machine at work.

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Rotary Type Metal Cleaning Machines

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By L. M. WAITE

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DEVELOPMENT of automatic machines for carrying out any predetermined sequence of operations in metal cleaning and in the preparation of metal parts for final finish has done much for industry. Both lessened waiting and reduced handling-time have speeded up final assemblies; a distinct accomplishment in cost reduction.

The extent to which finishing operations may be brought into added combination with cleaning and preparation, within the confines of a unit housing, is dependent quite largely upon the permissible size of the housing.

Different types of machines are available for the work of parts preparation. These are distinguished, quite largely, by the method of parts conveyance or feed utilized in the machine design.

The purpose herein is to describe and illustrate the rotary-drum type of feed, compactness of design, accessibility of units, and possible variation in sequence of operation. The machine illustrated is manufactured by the Metalwash Machinery Co., Inc., 27 Haynes Ave., Newark, N. J. Machines for washing, rinsing, drying and slushing are not uncommon, and have advanced in design to the point where the prospective purchaser may select on the basis of preferred construction and suitability or approval of assembly details.

However, there still remains necessity for job-design attention. Metal characteristics involving the possible action of solutions; work peculiarities as to shapes, projections, contours and sizes, all require consideration. For example, given a variety of parts, for the treatment of which equipment is to be purchased, what is the most universal method by which the different varieties may each be routed, tumbled and propelled through successive operation stages? Also many jobs involve the consideration of conveyor-loading equipment, to be used in bringing work to the charging inlet in cases where machines are not manually fed.

Two-Drum Rotating Type Machines

In connection with the two-drum rotating type machine selected for these illustrations, there are a number of existing and pending patents. However, these pertain to details by which accomplishment is gained rather than to type of machine. Certain of these details are of interest as representing design ingenuity.

The operations for which the particular size machines described are used are alkali-washing, rinsing to sewer, soluble-oil slushing and drying, in the order given. The work handled is peculiar to ball bearings exclusive of balls, and to a variety of stamped parts. The drying operation follows that of slushing because the purchasing company chose this sequence of operations after long experience in the production, shipping and handling and in the assembly-use of the product. The parts receive the treatments while confined in one or the other of two 20-in. diameter, rotating drums (A & B), approximately 12-ft. long. Each drum revolves in a separate, welded, vault-like chamber (C & D), accessible through panel removal. One side wall of each chamber is a side housing of the machine; the other wall is a side of a built-in, hot-air pressure-blast chamber (Z). The top drum has a receiving table and chute (G-1) and a discharge chute (H-1). The discharge chute (H-1) is the receiving chute (G-2) of the lower drum (B). The discharge chute (H-2) of the lower drum directs the work into mill or tote boxes upon completion of treatments. The charging table and chute (G-1) into the upper drum are approximately 48 in. above the floor, a convenient height for either manual or conveyor charging.

The drums are fabricated from 3/16-in. sheet-steel and have 3/16-in. round perforations of a suitable number per sq. in.

Helix Propelling Member

Within each drum a helix-propelling member (J) spiralling longitudinally of the drum, is welded to the inner surface and through-welded from the outer surface. This constitutes a spiralling flange 1¾ in. high with the spirals spaced and additionally held, by two lines of 4 in. long, half-round rod spacers (K). These are in line longitudinally directly opposite each to the other. Being half-rounds and fillet-welded, the spacers also tend to assure an easy tumbling action of the parts as the drums revolve. They also tend to prevent "side riding" into the pipe area at the top.

The 1 hp. constant speed motor unit shown, inclosed at (L), includes a Reeves variable speed device, driven from the motor and driving a speed reducer. The unit supplies the power for rotating the drums and is mounted on a separate plate member which is bolted to the end of the machine. The driving shaft of the speed reducer carries a roller-chain sprocket (M).

Parallel to the drums, extending through and projecting slightly beyond bearings in the end housings, are four shafts (N), 2 3/16 in. diameter. These are located 9½ in. below the horizontal c/l and out 9½ in. from the vertical c/l of the drums. On the outer ends of these, and outide of the housings and bearings, are mounted four driving sprockets (O) with their face-centers in line with the face-centers of the sprocket (M) positioned on the speed-reducer shaft.

Both Chain and Friction Drive

An endless chain (P) passes under the driving sprocket (M) over the four parallel shaft sprockets (O), all located at the (L) motor unit end of the machine. On each of these four shafts (N), a few inches within the housing at each end of each shaft, is mounted a flanged split collar (Q). Around the drums (A & B) at each end, a few inches in from the end, is a steel ring (R) 1¼ in. thick and having a 3-in. face. The face centers of these rings line up with the face centers of the shaft collars (Q). The assembly of the drums within the machine housing consists only of positioning the rings (R) between the flanges of the collars (Q) and permitting the drum to come to rest. Thus the drums are supported by the parallel shafts; the two upper shafts supporting the upper drum and the two lower shafts supporting the lower drum. This design provides a simple friction drive between the faces of the collars (Q) and the faces of the cast rings (R). Damage in case of a work jam, which might result, were a direct drive employed, is thus avoided.

At the front of the machine, directly on the line of the cross sectional center, is a

(CONT. ON PAGE 80)

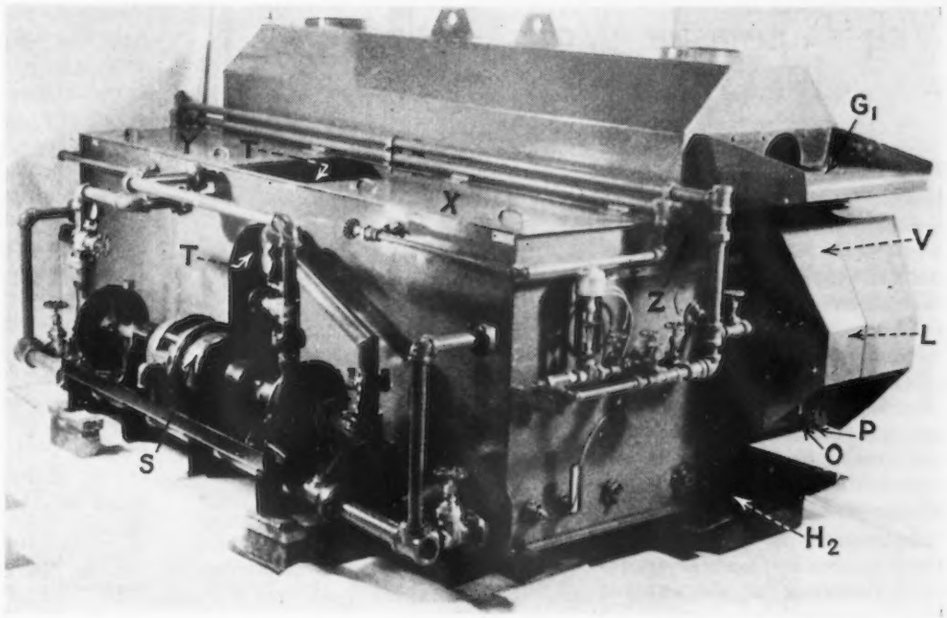
AT RIGHT

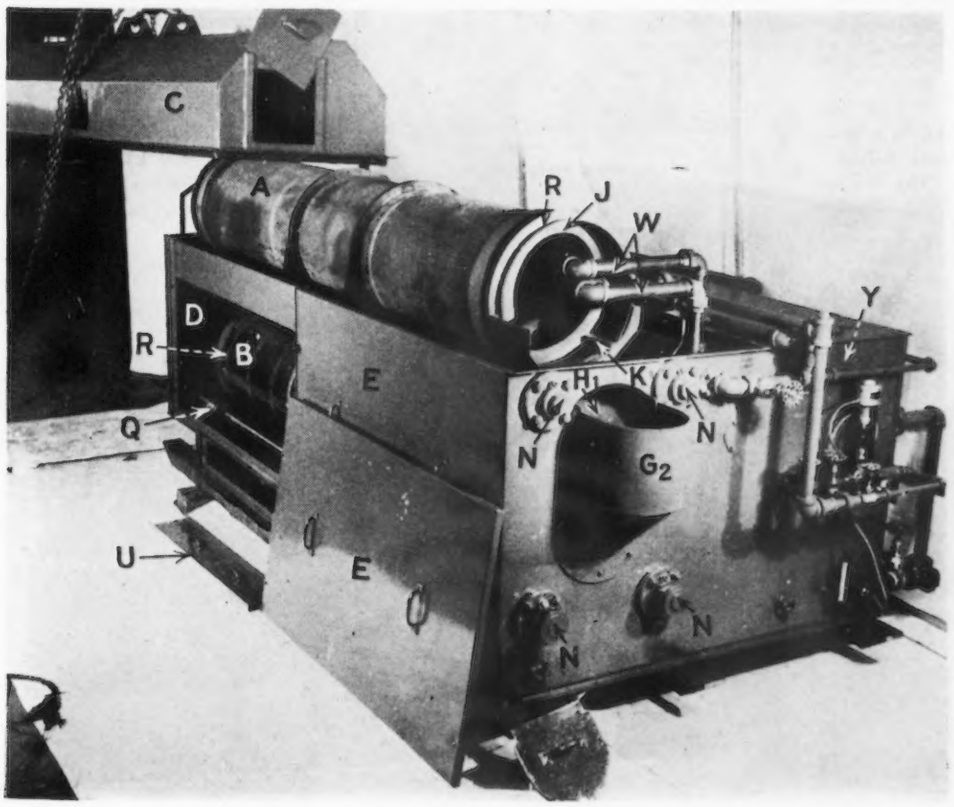
THE drum power unit is inclosed within the cover at L. The tote box for the finished work is directly beneath. The removable fan motor unit is directly in back of the front motor, within the open space shown at side and top. Thermostatic control for the contents of one tank is shown at the end

o o o

BELOW

UPPER drum housing and one panel of the lower drum chamber removed. The ready accessibility may be seen. The drum friction drive, helix feed flange and spacer, and solution piping are clearly visible.





Improvements in Production

New Spiral-Bevel Pinion Rougher With Automatic Work Cycle

THE Gleason Works, Rochester, N. Y., have recently brought out a new spiral-bevel pinion rougher which is from two to three times as fast in production as the previous type. The machine, shown below, will rough both spiral-bevel and hypoid pinions. Hydraulic power is employed in all movements except that of cutter drive. Rigid construction, speed and convenience in work-handling are featured.

Rigidity permits roughing cuts that consistently approximate finished tooth size; a factor in its relation to second-operation finishing cuts and tools.

The tripping of hand-controlled valves supersedes manual operations. Clamping of the chucked pinion is accomplished hydraulically. A built-in dechucking device releases the pinion at the completion of the cut.

Description

The cutter is mounted in a full circular cradle permitting adjustments through 360 deg. The design provides a heavy one-piece frame with the cutter cradle mounted at one side of the front c/l., and a column holding the work-head on the other side, with an overhead tie rigidly securing the two frame elements.

The work-head is mounted on a sturdy sliding base which swings about an axis other than the center of the machine, so that there is ample clearance between the work and cutter in work removal.

The cutter spindle is of improved type and driven by a large internal gear. The spindle is mounted on precision anti-friction bearings. A separate spindle motor is employed. Including speed change gears, there are only three gear meshes between the motor and the cutter spindle. The circular movements of the cradle and work spindle, for generating the tooth shape, are derived from the reciprocating movements of a pair of racks which are connected and are actuated by a hydraulically operated roll piston. Short trains of gearing transmit the motions of these racks to the cradle and to the work spindle. There are but seven gear meshes in this generating train. A hydraulic brake is provided to take up backlash in the train and to eliminate possibilities of a change of thrust affecting the quality of the work produced. This gear train takes the place of the crown gear and segment previously employed. Pinions of different ratios can be cut by changing the ratio of roll gears in the train to the work spindle.

The work-holding spindle accommodates taper bores up to 3.906 in. An outboard support holds the pinion rigidly against deflection from the thrust of the cut. The chuck is hydraulically operated. A close study of chucking operations has shown an average change-time of only 10 sec.

The hardened and ground index is of the notched-plate type. The

(CONCLUDED ON PAGE 82)

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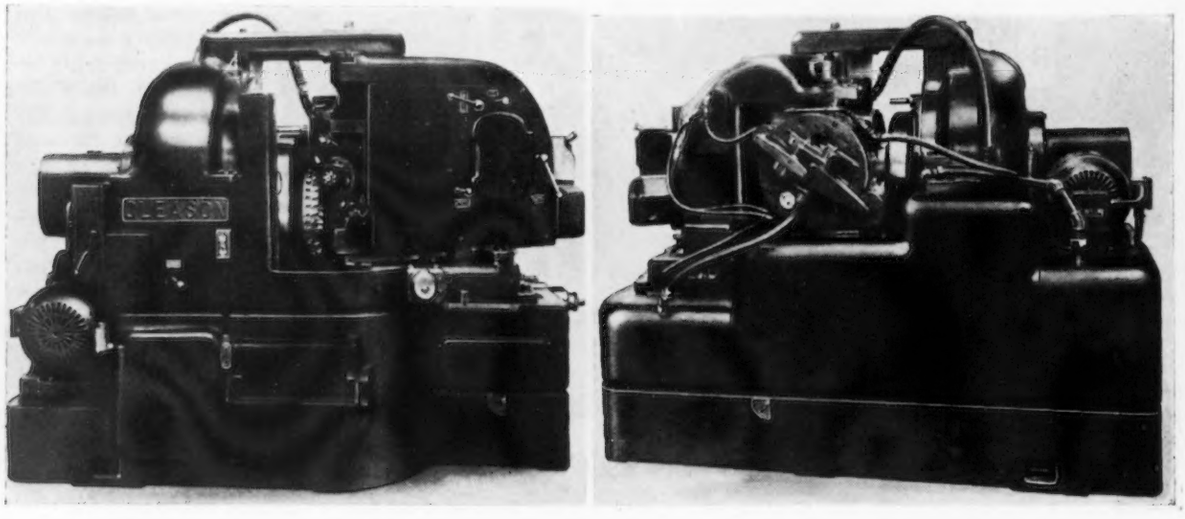
THIS spiral-bevel pinion rougher with automatic work cycle rates two to three times as fast in production as were previous models manufactured by this company.



and Shop Equipment . . .

Hydraulic Surface Grinder Has Table Speeds Up to 100 Ft. per Min.

PRATT & WHITNEY CO., Hartford, Conn., has placed on the market a new 14-in. vertical surface grinder with hydraulic table drive and with table speeds from zero up to 100 ft. per min. Increased weight and power and much higher table speeds than formerly employed feature the new model, outside and inside views of which are pictured below.

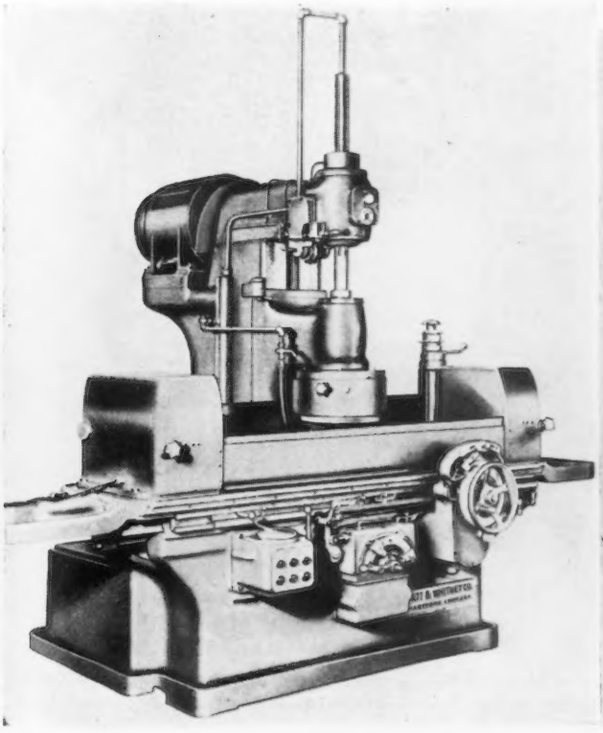
The spindle drive is the same direct geared connection employed previously by Pratt & Whitney in its vertical surface grinders. The motor is up out of the way, and its full power is transmitted to the wheel through a pair of hardened nickel-steel spiral-bevel gears. These have been particularly developed for this drive and give a spindle speed of 1265 r.p.m. and they run in oil. The oil level in the reservoir is maintained at a mark on the round gage on the front of the gear housing.

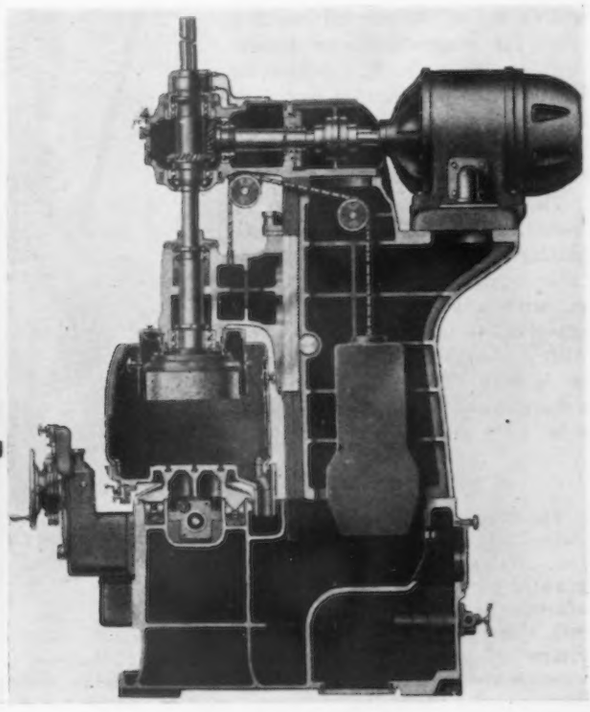
The spindle and drive mechanism are ball-bearing, employing preloaded bearings which are fully protected from dirt and moisture. Lubrication is by hand-pressure pump. The spindle and wheel flange are one-piece, with the upper end accurately splined for movement through the spiral-bevel gear. The lower spindle bearing absorbs the thrust of the grinding cut; end play is prevented by a series of compression springs which support the upper bearing. These springs are of sufficient capacity to carry the dead weight of the spindle and wheel parts, and keep the spindle in automatic adjustment to prevent wheel sag.

The wheel used is 14 in. in diameter, 5 in. high and 1½ in. thick. It is held in a cast iron wheel-mount which bolts to the spindle flange. Wheel change is quckly accomplished. A strong steel guard surrounds the wheel and provides safety. Wheel truing is by a built-in device on the end of the table.

The wheel down-feed mechanism is of ratchet and pawl type, and produces power feeds ranging from 0.00025 to 0.005 in. at each end of the table stroke. In addition, either a slow or a fast handwheel feed is engaged by pulling the handwheel

FACILITY of control may be seen in view at left. The cross-section view illustrates the completeness of design provision for meeting the requirements of accuracy.





in or out. The wheel-head is mounted on broad vertical ways, with a narrow guide for accurate alinement.

Hydraulic Mechanism

The hydraulic mechanism is driven by a separate 5-hp. motor mounted on a pad on the bed at the right rear side. Oil for the hydraulic system is carried in a tank in the base of the column. It is drawn from this tank through a large Cuno filter. The control valve and lever are on the front of the bed under the operator's hand and vary the table speed from zero up to 100 ft. per min. Two adjustable stops are provided for quick setting. Adjustable dogs provide automatic table reversing at any desired point. These are located along a longitudinal rack on the front of the bed. Hand reverse is also available to the operator. The table is fully inclosed by sheet metal guards which can be lowered or raised to confine the spray of coolant which is supplied to both the inside and outside of the wheel from a tank cast in the bed at the left rear. A separate ½-hp. motor drives the built-in coolant pump. Coolant return is through a large opening to the tank. Baffle plates and a strainer, hung in the tank, can be lifted out for cleaning.

The Controls

Controls are grouped on the front of the machine; push button is provided for all three motors, and on top of the control box is a lever for magnetizing or demagnetizing the chuck. Indicating lights in the push-button box show current circuit contacts. Lubrication is in general by the reservoir system.

The machine weighs 12,000 lb. including the three motors. All castings are heavily ribbed. The table working surface is 12 x 36 in. with a maximum longitudinal travel of 45 in. A magnetic chuck with a working surface of 11 x 34 in. is used. The machine occupies a floor space 14 ft. 5 in. long, 7 ft. 4 in. wide and is 9 ft. 7 in. high.

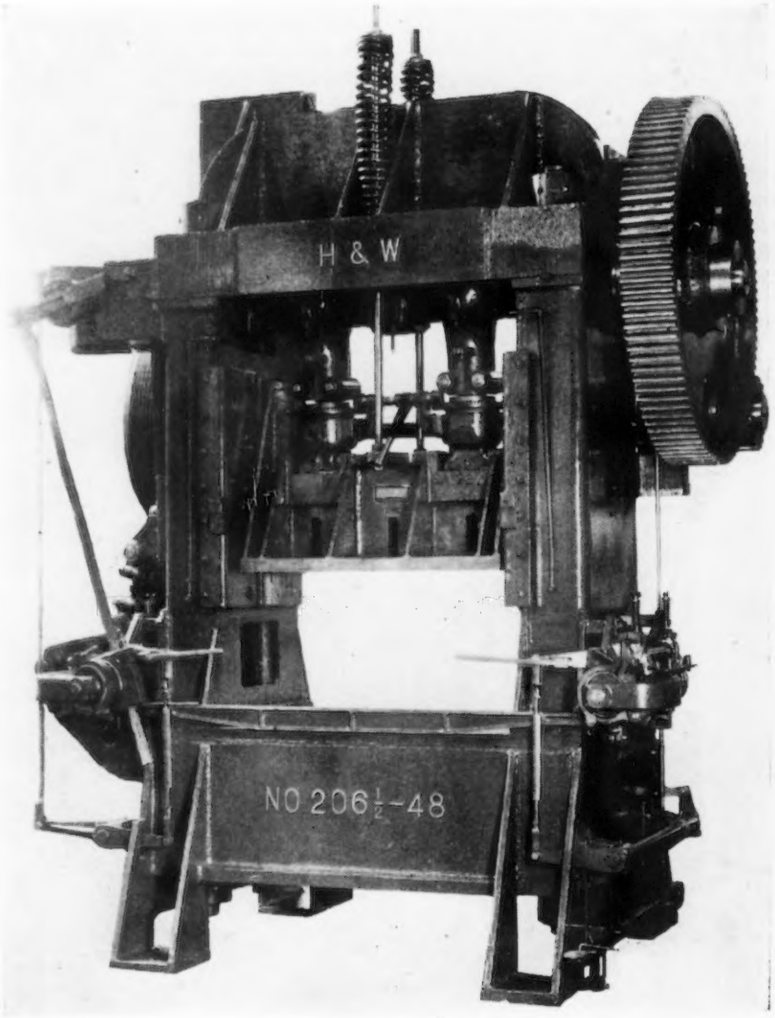
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., has been granted patents for exclusive manufacture on its Condor compensated belt, a low tension rubber belt. By virtue of its construction, ply stresses are equalized when the belt flexes around the pulley.

Welded-Steel Straight-Sided Press With Automatic Feeds

SINGLE geared, straight sided, double-crank, welded steel presses arranged with automatic feeds and scrap cutter have been added to the welded steel press line of the Henry & Wright Mfg. Co., Hartford, Conn. In general construction, the automatic feeds and scrap cutters are similar to those of the company's dieing machine. The rigidity of the patented welded steel frames together with the precision roll feeds is emphasized as permitting use of progressive dies for the high production of close-limit stampings.

This machine, illustrated below, is of shrunk-in tie-rod type of construction. Bed, uprights, crown and slide are made of special welding quality steel and are heat treated before machining to release any strains that may have been set up by the welding. Unusual rigidity resulting in reduction of the deflection commonly encountered in straight sided, double-crank presses and in minimum of breakage from fatigue are claimed for the design.

The large gears are also made of welded steel, heat treated to remove stresses set up in welding. With this construction steel of higher carbon content is used for the rim, with advantages in tooth



THESE machines are of shrunk-in tie-rod construction, and feature unusual rigidity and ready modification to suit individual requirements. The precision roll-feeds permit use of progressive dies for high-production of close-limit stampings.

toughness and wearing qualities. Pinions are made of steel of correspondingly higher carbon content.

Crankshafts are hammered alloy-steel forgings, heat treated and ground, and are mounted in removable hard bronze bushings. The drive shafts are equipped with Timken bearings in cartridge-type mountings. This construction permits removal of the entire drive shaft assembly without disturbing the original bearing adjustment; it also facilitates erection of machines of a size requiring shipment in the knockdown condition.

Major castings, such as connections and flywheel, are made of a high test iron featuring a high tensile strength.

The jaw clutch located in the large gear has three simultaneous driving points, each locked in place after engagement by receding plugs, thus preventing clutch knock near bottom of stroke. The striking faces are hardened and ground steel inserts, and are readily removable. Spring counterbalanced slide, releasing brake, together with single and continuous operating foot treadles, are standard equipment.

Presses may be driven either by direct-connected motor or by flat or V-type belt, according to requirements. For belt drives the motor may be mounted on machine.

Automatic double roll feeds are the same as those on the dieing machine but are modified slightly to obtain proper mounting to sides of welded steel frame. The hardened rolls, ground to close limits and of a diameter that insures ample contacting surfaces, are mounted in rigid frames located at each side of press. The upper roll is driven positively by the lower roll through large steel gears which are actuated through a ratchet-and-pawl mechanism. The mechanism is normally arranged to feed from right to left but can be furnished to feed in the opposite direction. The rolls on the left-hand side of machine are driven from crankshaft through hardened bevel gears and a driving rack, while those on right-hand side are driven in synchronism with opposite rolls by means of a connecting rack. The feeds are arranged with an automatic hand-controlled latch placed within easy reach of operator for release of rolls for the continuous feeding of strips without stopping the press. All feed adjustments are readily accessible. Feed pitch is adjustable and the timing of roll feed action with relation to crankshaft rotation can be varied conveniently. Cam actuated roll release mechanism is also included.

The press illustrated has a 6½ in. crankshaft at bearings and has bolster area of 36 x 47 in., the distance between uprights being 48 in. The machine has a 6 in. stroke and is single geared to operate at 60 strokes a minute. The height is 142 in. and the floor space occupied, 79 x 112 in., overall. The weight of the machine, exclusive of motor, is about 29,000 lb.

The scrap cutter is of rigid construction and of ample proportion to cut scrap into lengths equal to the feed pitch. It is driven directly from crankshaft by individual slide and pitman arranged so that pitman is close to the crankshaft main bearing. It is claimed that in this way the extra load imposed upon the crankshaft is reduced to a minimum. The cutter is adjustable horizontally in direction of the feed and also vertically to meet metal line variations. In addition, the gate is independently adjustable.

Roll feeds of this press are designed for material up to 12½ in. wide, feeds having maximum feed pitch of 14 in. Provision is made for V-belt motor drive, the motor being attached to vertical platform integral with crown, as shown. Modifications from standard specifications to meet individual requirements may be made readily because of the absence of pattern requirements.

Hydraulic Brake Uses Standard Cylinders

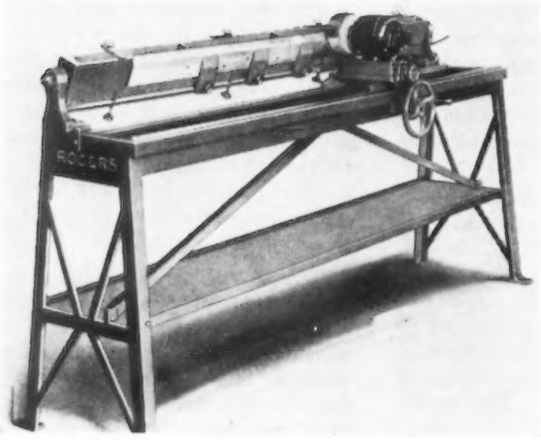
A NEW hydraulic bridge motor-brake has been put on the market by the Morgan Engineering Co., Alliance, Ohio. An installation is pictured below.

The base mounting is of welded construction, making the upright members an integral part of the base. The master cylinder, as well as the brake shoe cylinder, is a standard Lockheed product. A small oil storage tank is provided in the highest point of the oil line as an emergency oil supply in the event of leakage. Molded brake lining, ground to exact diameter, is employed. Brake adjustment is by means of two nuts, one for each shoe. Motor armature can be laid back by the removal of one pin and without disturbing any adjustments.

A shunt magnet is supplied as emergency equipment and operates, in conjunction with the cylinder, for setting the brake when the main line switch is pulled.

The equipment is built in three sizes rated as to working torque in lb. ft., 500 lb. = 10 to 35 hp., 1000 lb. = 35 to 75 hp., 1500 lb. = 75 to 135 hp. on brake wheels respectively 16 x 6¼ in., 20 x 8¼ in., 24 x 10¼ in.

THE employment of standard stock parts simplifies maintenance in the use of this rugged equipment.



ADJUSTMENTS and wheel traverses provide for ample angularity variation in shear-blade conditioning.

Text below.

Shear Blade Sharpener Employs Simple Units

A LIGHT shear-blade sharpener is announced by Samuel C. Rogers & Co., Buffalo, N. Y. The machine is shown above, and consists of a unit bed of cast construction mounted upon two cast iron standards; a carriage traverse member for motor and grinding wheel; and a one-piece knife bar member supported by separate end brackets.

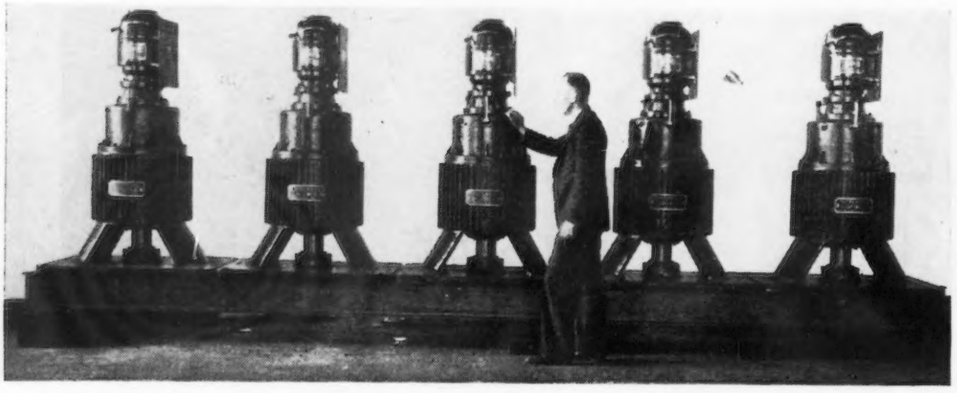
The bed is provided with V-rays for carriage travel; movement is by rack and pinion, with rack teeth cut in the front side-member of the bed.

The carriage also has a cross-feed slide, and a steel motor plate having swivel adjustment for straight or concave bevel grinding. The knife-bar one-piece casting houses a coolant reservoir and is fitted with knife set-up gages and with clamps and adjustment for turning and locking into position for grinding any degree of flat or concave knife bevels. A 6 in. diameter grinding wheel is mounted on the motor shaft and is amply guarded. Three sizes are built: 61, 76 and 84 in., weighing respectively 600, 700 and 800 lb. The motor used is 1/3 hp., 1750 r.p.m. of any voltage or frequency.

Speed Reduction Unit in 1800 to 1 Ratio

A SPEED reducing drive featuring high reduction ratio and low speed has been built by the Patterson Foundry & Machine Co., East Liverpool, Ohio. The units are driven by 1800 r.p.m. motors and have a speed of 1 r.p.m. on the output shaft, or a speed reduction of 1800 to 1.

The five reducers pictured below, represent part of a shipment of 14 units. In spite of their size, which is indicated by comparison with the man standing, these are only 5-hp. units with output shafts 5 in. in diameter. The equipment was supplied for driving agitators in liquid mixing tanks used in chemical processes and the entire suspended load, and the thrust of the agitator, totaling approximately 5000 lb., is carried on a tapered roller bearing. Gearless reduction principle is employed. Oilless gear bearings are used in the base to prevent shaft vibration or distortion and to protect the reducer bearings located above.



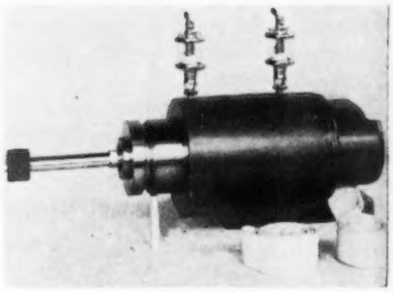
THESE units were designed to meet the requirements of large chemical companies in work calling for extremely slow shaft revolutions.

See text at left.

Grinding Attachment For Internal Work

THE Brown & Sharpe Mfg. Co., Providence, R. I., has added an internal grinding fixture, No. 42, of ball-bearing design, to its line of machine attachments. The equipment is illustrated herewith.

The spindle runs at 12,000 r.p.m. on preloaded bearings and is



driven by an endless canvas belt. The wheel arbor is seated by a taper and held by its threaded end in the spindle.

This fixture has been designed particularly for use on No. 2, 3, and 4 universal machines. The body features massiveness for the absorption of vibration. The net weight is 90 lb.

"Profit Motive Must Be Preserved"

o o o

By HON. DANIEL C. ROPER*
Secretary of Commerce

o o o

FROM time to time we have heard expressions that the Roosevelt administration is opposed to business profits. This is far from true. The President himself has frankly and emphatically stated his belief in the profit motive as a fundamental incentive to work and economic achievement. Thrift is as essential to our social well-being today as it ever has been and thrift means profits.

The role of the Federal Government is to promulgate such methods and to advocate such protective measures as will protect the American people from unsound and unethical means of profit.

It is well also that we recall to mind the fact that our entire system of taxation is based upon profit. Thus the elimination of profits would mean the abolition of the Government's source of revenue.

It should be borne in mind also that the destruction of the profit motive would greatly reduce the buying power of the public.

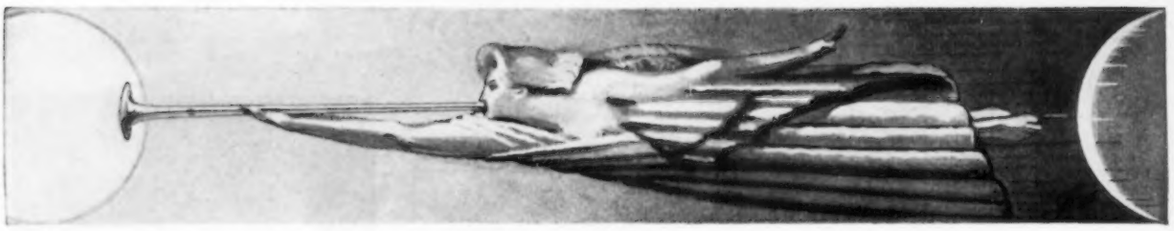
It is apparent, therefore, that the Administration is fully cognizant of the value of the profit system and is equally aware of the need to eliminate its abuses. From this it may be assumed that governmental participation in business and in relief is only an emergency expedient and not to be interpreted as a plan to usurp the rightful role of private business.

Perhaps a return to prosperity has been retarded in some degree by unfavorable sentiment and by a lack of complete understanding of the basic philosophy of the New Deal, but I believe that as business observes the unfolding of the Government's policies it is becoming increasingly desirous of lending its wholehearted support. It is the function of the Department of Commerce to facilitate as much as possible this cooperation between industry and the Administration.

As I study the reports that come to me of business conditions throughout the country I note that exports of machinery for the first ten months of 1934 were more than $178,000,000, an increase of approximately $78,000,000 over the corresponding ten months of 1933. The exports of passenger automobiles and trucks for the first ten months of 1933 were $43,000,000 and for 1934 this figure increased to $107,000,000. Similar reports for other major industrial commodities, such as iron and steel products, copper, chemicals, etc., show sizable increases in exports in terms of dollars. I interpret this to mean that the efforts of the Administration to encourage business are meeting with success and that we shall see greater increases in the future.

By carrying the significance of these figures further, I feel that this increase in our exports indicates that our manufacturing concerns must be employing more men and using more materials. Net sales of wholesalers increased a billion and three-quarter dollars or about 14 per cent last year. Retail sales increased about three and one-half billion dollars during the same period. This was the first yearly increase in the dollar value of retail sales since 1929. This seems to indicate that the velocity of money is gaining and that as its rate of circulation increases business will feel an increasing demand for goods. A greater demand for goods will mean profits and through profits the Administration sees the employment of more men and the decrease in relief rolls.

* Written especially for Chilton Publications.



NEWS OF THE WEEK

Republic and Corrigan, McKinney Answer Department of Justice Suit

SALE of the assets of the Corrigan, McKinney Steel Co. to the Republic Steel Corpn. will not substantially restrain competition in the steel industry, and is not in violation of the Clayton Act, according to the joint answer of the Republic and Corrigan, McKinney companies to the petition of the Department of Justice to enjoin the merger of the two companies. The answer has been filed in the Federal district court at Cleveland.

"The proposed purchase of the assets of Corrigan, McKinney by Republic," the answer stated, "is not based on any purpose to eliminate or lessen competition or merely to create a larger unit in the steel industry, but rests on sound, practical business considerations. While inevitably said purchase, if consummated, will eliminate such competition between these two companies as now exists, it will not substantially lessen competition or tend to restrain commerce in any section or community or to create a monopoly of any line of commerce within meaning of section 7 of the Clayton Act."

In explaining this contention, the answer points out that Republic's ingot capacity is only 7.2 per cent of the total of the industry, and Corrigan, McKinney's only 1.5 per cent. The acquisition of Corrigan, McKinney's assets would not change Republic's relative position in the industry.

Furthermore, the answer continued, since all large steel companies have plants, offices and selling organizations in States in which Republic and Corrigan-McKinney are chiefly located, and since the industry, as a whole, has a capacity far in excess of present or even normal demand, competition in the industry has at all times been and will continue to be intense, regardless of whether the proposed merger is or is not completed.

The "practical business considerations" underlying the proposed merger were explained as follows:

Corrigan, McKinney and subsidiaries have production capacity for pig iron and semi-finished steel largely in excess of finished steel. Republic normally has an excess of finished steel facilities over those for semi-finished steel.

If the merger were completed, Republic's plants in Cleveland, Youngstown, Canton, Massillon and Warren, Ohio, would provide easily available outlets for pig iron and semi-finished steel produced in Corrigan, McKinney's Cleveland plant. Following the merger, Republic would have balanced finished and semi-finished steel facilities, advantageous water frontage, plants and docks along the lakes at Cleveland, Buffalo and Chicago, and better integration from iron ore through pig iron, semi-finished steel to finished steel.

Referring to pig iron, the answer stated: "In times of normal demand Republic sells pig iron only from its Alabama plant and its Buffalo plant, which, by reason of their locations, do not compete substantially in the markets served by Corrigan, McKinney. In times of normal demand Republic's other plants producing pig iron, all located in Ohio, do not produce pig iron for sale. Competition between Republic and Corrigan in respect to pig iron is not substantial at any time, and in normal times is negligible."

The answer explained that in times of normal demand Republic's production of semi-finished steel for sale is reduced to a minimum. In 1933, however, out of 1,465,300 gross tons of semi-finished steel produced by Republic, 105,933 tons was produced for sale. Of the latter amount, 29,137 gross tons was alloy steel of a type not competing with any steel manufactured by Corrigan, McKinney. In that year Corrigan, McKinney produced for sale 145,517 gross tons of semi-finished steel. The distribution made of this steel showed that there were only six States in which a competitive situation existed, and the relative unimportance of these sales is illustrated by the fact that the semi-finished steel capacity of all steel plants in these six States, Ohio, Illinois, Indiana, Michigan, Pennsylvania and New York, totaled 47,000,000 tons.

Situation in Sheets

According to the answer, Republic, in 1933, sold only 6.1 per cent of the steel sheets produced in the country, and Newton Steel Co., Corrigan, McKinney subsidiary, sold in the same year only 3.3 per cent. Furthermore, half of Republic's sheets were of a variety not in competition with any of the sheets produced by Newton.

"Existing sheet capacity of the industry," said the answer, "and the large additional capacity of continuous mills now, or shortly to be, in the course of construction, precludes the possibility that the affiliation of Republic's and Newton's sheet facilities will restrain commerce or tend to produce a monopoly."

February Pig Iron Producing Rate Up 20.5 Per Cent

PRODUCTION of coke pig iron in February totaled 1,608,552 gross tons, compared with 1,477,336 tons in January. The daily rate in February, at 57,448 tons, increased 20.5 per cent over the January rate of 47,656 tons a day. The February daily rate was the highest for that month since 1931, when it reached 60,950.

There were 96 furnaces in blast on March 1, making iron at the rate of 56,695 tons a day, against 90 furnaces on Feb. 1, operating at the rate of 54,605 tons a day. Ten furnaces were blown in during the month, of which five were Steel Corporation units, three were independent steel company furnaces, and two were merchant stacks. Four furnaces were blown out or banked, two of which were Steel Corporation stacks and two independent steel company furnaces.

Among the furnaces blown in were the following: One Carrie, Carnegie Steel Co.; three Ensley and one Fairfield, Tennessee Coal, Iron & Railroad Co.; one Standish, Chateaugay Ore & Iron Co.; one Cambria, Bethlehem Steel Co.; one Oriskany, Lavino Furnace Co.; one Hubbard, Youngstown Sheet & Tube Co., and one Calumet, Wisconsin Steel Co.

Furnaces blown out or banked included: One Farrell, Carnegie Steel Co.; one Gary, Illinois Steel Co.; one Eliza, Jones & Laughlin Steel Corpn., and one Haselton, Republic Steel Corpn.

Daily Average Production of Coke Pig Iron

Gross Tons

	1935	1934	1933	1932
January	47,656	39,201	18,348	31,380
February	57,448	45,131	19,798	33,251
March	.....	52,243	17,484	31,201
April	.....	57,561	20,787	28,430
May	.....	65,900	28,621	25,276
June	.....	64,338	42,166	20,935
½ year	.....	54,134	24,536	28,412
July	.....	39,510	57,821	18,461
August	.....	34,012	59,142	17,115
September	.....	29,935	50,742	19,753
October	.....	30,679	43,754	20,800
November	.....	31,898	36,174	21,042
December	.....	33,149	38,131	17,615
Year	.....	43,592	36,199	23,733

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1935	1934	1935	1934
January	1,477,336	1,215,226	10,048	11,703
February	1,608,552	1,263,673	12,288	10,818
March	.....	1,619,534	.....	17,605
April	.....	1,726,851	.....	15,418
May	.....	2,042,896	.....	10,001
June	.....	1,930,133	.....	10,097
½ year	.....	9,798,313	.....	75,642
July	.....	1,224,826	.....	10,188
August	.....	1,054,382	.....	8,733
September	.....	898,043	.....	7,100
October	.....	951,062	.....	9,830
November	.....	956,940	.....	8,134
December	.....	1,027,622	.....	4,563
Year	.....	15,911,188	.....	124,190

*These totals do not include charcoal pig iron. The 1933 production of this iron was 32,941 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1935	1934	1933	1932
January	3,926	7,800	2,602	6,256
February	6,288	7,071	2,863	7,251
March	...	7,197	2,412	7,157
April	....	8,838	1,908	5,287
May	.....	9,099	3,129	4,658
June	.....	9,499	4,088	6,090
July	.....	7,880	6,783	3,329
August	....	6,043	7,756	3,070
September	.....	4,986	10,034	3,213
October	.....	5,765	8,634	4,286
November	.....	6,610	7,639	4,435
December	.....	4,399	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons) February (28 Days)	Production (Gross Tons) January (31 Days)	March 1 Number in Blast	March 1 Operating Rate, Tons a Day	February 1 Number in Blast	February 1 Operating Rate, Tons a Day
New York:						
Buffalo	102,199	90,260	5	3,650	5	3,185
Other New York and Mass.	....	....	1	205	0	....
Pennsylvania:						
Lehigh Valley	24,551	24,980	2	780	2	805
Schuylkill Valley	....	....	0	....	0	....
Susquehanna and Lebanon Valleys	....	....	0	....	0	....
Ferromanganese	....	....	0	....	0	....
Pittsburgh District	314,620	277,461	18	10,920	18	11,160
Ferro. and Spiegel	4,435	5,008	1	160	1	160
Shenango Valley	38,526	25,880	2	1,040	3	1,405
Western Pennsylvania	47,184	41,870	3	1,865	2	1,420
Ferro. and Spiegel	5,938	5,040	1	210	1	210
Maryland	60,975	71,182	3	2,180	3	2,295
Wheeling District	112,282	102,905	6	4,010	*6	*4,510
Ohio:						
Mahoning Valley	196,066	183,781	10	6,735	10	6,365
Central and Northern	188,675	177,842	11	6,740	11	6,750
Southern	34,187	37,387	3	1,220	3	1,205
Illinois and Indiana	306,923	273,269	15	10,580	15	10,805
Mich. and Minn.	47,594	50,500	3	1,700	3	1,540
Colo., Mo. and Utah	20,979	20,676	2	750	2	665
The South:						
Virginia	....	....	0	....	0	....
Ferro and Spiegel	1,915	....	1	70	0	....
Kentucky	12,964	19,757	1	465	1	360
Alabama	88,539	69,538	8	3,415	4	1,765
Ferromanganese	....	....	0	....	0	....
Tennessee	....	....	0	....	0	....
Total	1,608,552	1,477,336	96	56,695	90	54,605

*Revised. Wheeling Steel Corpn. blew in second La Belle furnace during January.

The Traffic Club of Pittsburgh will hold its 34th annual dinner at the Hotel William Penn, Pittsburgh, on March 7. On the various committees governing the meeting are many prominent railroad executives and traffic executives of steel companies. Included among the latter are John A. Coakley, general traffic manager, subsidiaries of the United States Steel Corpn.; F. M. Ewing, traffic manager, Harbison Walker Refractories Co.; F. M. Garland, traffic manager, Pressed Steel Car Co.; Clem W. Gottschalk, assistant traffic manager, Jones & Laughlin Steel Corpn.; Leonard G. Hults, traffic manager, United Engineering & Foundry Co.; M. C. Richards, traffic manager, Spang, Chalfant & Co., Inc.; C. P. Schrecongost, traffic manager, Hillman Coal & Coke Co., and C. W. Trust, assistant traffic manager, Eastern district, subsidiaries of the United States Steel Corpn.

Tin Plate Exports Doubled in 1934

TIN plate was the second most important product on a tonnage basis in the 1934 iron and steel export trade of the United States, being surpassed only by iron and steel scrap, according to a summary prepared by the Commerce Department's iron and steel division.

The total of 184,299 gross tons of tin plate shipped abroad from the United States during the year was distributed among 53 overseas markets ranging from 1 ton to the United Kingdom to 39,863 tons which were consigned to Japan, with 23 outlets taking 1000 tons or more. While still 35.2 per cent less than the 243,560 tons shipped to 58 markets in 1929, this tonnage represents the first notable gain recorded since that year, and being 97.6 per cent above the 1933 trade embracing 38 markets.

Tin plate constituted 6.7 per cent of all iron and steel exports in 1934—2,832,764 tons—against 7.1 per cent of the 1933 aggregate.

Japan maintained its position as the leading foreign market for American tin plate with purchases of 39,863 tons compared with 23,944 tons in 1933, while China absorbed 24,160 tons, an increase of 9834 tons, and continued to be the second major market. Two South American countries ranked third and fourth, Argentina receiving shipments to the extent of 20,093 tons, an increase of 10,425 tons, while 11,428 tons were consigned to Brazil which increased its share by 8212 tons. Mexico was the fifth market sharply increasing its participation by 6606 tons to account for 9940 tons, the Philippine Islands ranked next with purchases of 8683 tons, an increase of 5092 tons.

Ohio River Steel Shipments Higher

MOVEMENT of iron and steel products on the Ohio River in the Pittsburgh district in January amounted to 52,656 net tons, compared with 46,887 tons in December, 51,710 tons in November, and 54,109 tons in January, 1934, according to the latest report of the United States Engineer's Office, Pittsburgh. Total movement of steel products on the Monongahela River in January was 48,831 tons, compared with 42,248 tons in December, and 27,158 tons in January, 1934. Shipments of iron and steel on the Allegheny River last month totaled only 1075 tons.

Baldwin Locomotive Works Reorganizing

THE Baldwin Locomotive Works, Philadelphia, has filed a petition under the provisions of Section 77B of the Federal statutes providing for the reorganization of corporations. An order was entered by Judge Dickinson approving this petition as complying with the statutory provisions. This order provides that Baldwin may continue temporarily in possession of its properties with authority to continue to operate its business as heretofore.

This action affects the parent company only and does not affect the status of any of its subsidiaries, pursuant to the terms of the order. The business of the Baldwin Locomotive Works will be continued, for the present at least, without cessation of operations or change in operating conditions or business relations. This action has been made necessary through the reduction of the company's working capital to a place where it cannot meet its operating expenses and also its fixed charges. Plans are under way for the reorganization of the company's financial structure to reduce its fixed charges and to provide essential working capital.

OFFICIALS of the Amtorg Trading Corpn. and United Engineering & Foundry Co. signed contract for $3,000,000 worth of mill equipment at Pittsburgh last week. George T. Ladd, president of United Engineering & Foundry Co., and I. V. Boyeff, chairman of the board, Amtorg Trading Corpn., are shown affixing their signatures. Standing, left to right, are: Joseph Kinney, Jr., assistant to the vice-president, United Engineering & Foundry Co.; Joseph Michael, Amtorg attorney; V. K. Bogdan, first vice-president of Amtorg; K. C. Gardner, vice-president, United Engineering & Foundry Co.; James S. Crawford, attorney; I. Z. Rogachevsky, president, Zaporojstal Steel Works, for which the equipment has been ordered; Charles M. Muchnic, representing United Engineering, and N. I. Naryshkin, metallurgical engineer, Amtorg Trading Corpn.

PERSONALS

W. A. HAUCK, who has been identified with the American Iron and Steel Institute in connection with code matters, has been appointed assistant to the president of the Lukens Steel Co., Coatesville, Pa. He is a graduate of Lafayette College, with the degree of mining engineer, and was formerly assistant comptroller of the Bethlehem Steel Corpn. Subsequently, he was connected with George W. Goethals, Inc., in company management and engineering work.

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L. G. SULLIVAN has been elected a vice-president of the Atlas Steel Casting Co., Buffalo. After his graduation from Yale University, he served as captain of ordnance in charge of the Buffalo district. For the past 15 years he has been head of the New York office of the Atlas company, where he will continue in charge of Eastern sales.

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R. B. MILLAR, heretofore in charge of mill schedules for the Bethlehem Steel Co., Bethlehem, Pa., has been made assistant to the vice-president in charge of sales, to succeed the late J. H. KESSACK. C. S. GOERLICH, formerly manager of order entry, has been appointed manager of orders and schedules.

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H. W. CALDER has been appointed manager of the New England sales office, at 10 High Street, Boston, of the Union Chain & Mfg. Co., Sandusky, Ohio. H. F. EDGE has been made manager of the Atlanta sales office with headquarters at 101 Marietta Street.

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W. ROSS GILMORE has been elected president of the Superior Steel & Malleable Castings Co., Benton Harbor, Mich.

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CHARLES E. NESBITT has been honored by the American Chemical Society, Pittsburgh section, with the Pittsburgh Award for 1934. Mr. Nesbitt has been treasurer of the local group for the past 15 years. After being graduated from Ohio State University in 1904, he went to Pittsburgh as chemist at the Carnegie Steel Co.'s Edgar Thomson Works, and has served continuously with that company, excepting a five-year period with the National Tube Co. He is also a member of various chemist committees of the United States Steel Corpn.

W. A. HAUCK

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DR. F. M. WALTERS, JR., has been appointed physical metallurgist of the Youngstown Sheet & Tube Co., Youngstown, Ohio. He formerly had been research metallurgist with the Vanadium Alloys Steel Co., associate physicist of the Bureau of Standards at Washington, and director of the metallurgical research of Carnegie Institute of Technology. In 1932 he received the Howe Memorial Medal of the American Society for Metals.

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CHARLES R. HOOK, president, American Rolling Mill Co., spoke on a radio program over the Columbia network, Feb. 28, on the 30-hr. week bill. His remarks were along the same lines as his testimony at the NRA code employment provision hearings covered in THE IRON AGE, Feb. 7, page 45.

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GRISWOLD A. PRICE, who, since Jan. 1, has been manager of sales at St. Louis for Illinois Steel Co., Carnegie Steel Co. and Tennessee Coal, Iron & Railroad Co., has been named assistant general manager of sales of the bar and alloy steel divisions of Illinois Steel Co., Chicago. He succeeds C. H. RHODES, who recently was made director of purchases for the United States Steel Corpn., with headquarters in New York. ROBERT KORSAN, JR., succeeds Mr. Price as manager of sales in the St. Louis office. Mr. Korsan became connected with Illinois Steel Co., in 1896 and worked successively in the sales, accounting, claim and order departments. In 1919 he was made assistant manager of the Chicago district sales office.

A. P. SELBY, who in 1931 was made assistant manager of sales of the Milwaukee branch of the Chicago district sales office of the Illinois company, has been moved to Chicago as assistant manager of sales. Mr. Selby started with Illinois Steel in 1907 as a clerk in the general sales department. In 1919 he was transferred to the Chicago district sales office and from there to Milwaukee, where he was made assistant manager of sales. He is succeeded by JOHN R. JOHNSON, who becomes assistant manager of sales at the Milwaukee branch of the Chicago district sales office. Mr. Johnson is a graduate of the University of Illinois, and started to work for the Illinois Steel Co. in 1925.

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BEN KAPLAN of M. S. Kaplan & Co., has been elected president of the Chicago chapter of the Institute of Scrap Iron and Steel. Other new officers are ARTHUR PRICE, Price, Watson Co.; MAX PATINKEN, Peoples Iron & Metal Co., Chicago, and MORTON TELLER, Teller Iron Co., Hammond, Ind., vice-presidents. WALTER ERMAN, Erman-Howell Co., is treasurer, and ARTHUR L. JEFFERY, secretary.

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GEORGE A. RENARD, secretary of the National Association of Purchasing Agents, will be guest speaker at the March 14 meeting of the Purchasing Agents' Association of Chicago. Officers for the fiscal year will also be nominated at that meeting, which will be held at the Hotel Sherman.

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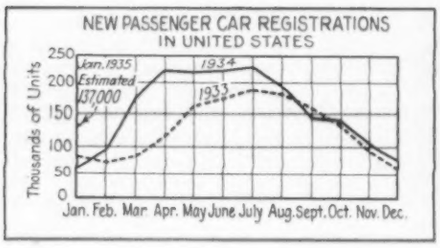
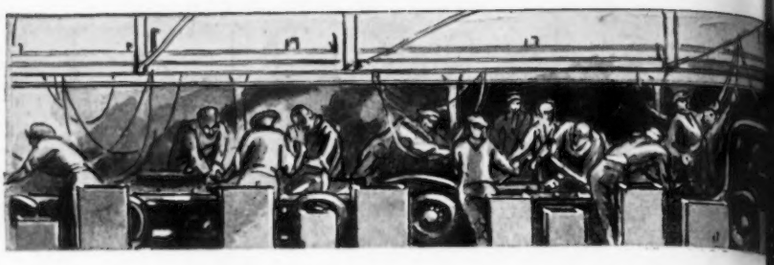
WILLIAM B. WESTON, who has been Detroit district manager of sales of the Carnegie Steel Co., has been appointed assistant to C. V. MCKAIG, vice-president and general manager of sales, Pittsburgh, and will have his headquarters in the latter city. PHILIP M. GUBA, who has been Mr. Weston's assistant, has succeeded the latter as manager of sales for the Detroit District. These changes became effective March 1.





THIS WEEK ON THE

Car Makers Confident of Sales Gains As They Plan Larger Output

DETROIT, March 5.

WHILE Wall Street appears jittery about the business outlook, the slight evidence of nervousness apparent in Detroit the last two weeks is giving way to a more confident attitude. Perhaps the automobile industry is inclined to stick its head in the economic sand and attempt to ignore what is going on about it, but figures show that it met with success in doing that last year. To put the matter differently, it has never been inclined to fold up its tent and steal away in the night when faced by formidable economic adversaries. There is no reason to believe it will reverse its past policies at this time.

It is getting to be the custom for those who view the industry at a distance to say that the present production rate can't hold, that car manufacturers are turning out vehicles far beyond the capacity of the country to absorb them and that a "drawing in" of lines in the near future is inevitable. Yet there is little on the horizon to give plausibility to this argument. Of course, motor car production can't be stretched upward indefinitely, and obviously weekly assemblies are not far from the peak which will be attained this year. But the point is that, with the exception of Plymouth, the two major car makers have by no means satisfied dealers' requirements.

Already at dizzy heights, Ford intends to climb still higher. In February its output in the United States and Canada totaled 135,663 units, of which 126,646 units were built in this country. This month it is heading for 160,000 units as its goal. Tentative schedules for April call for 170,000 units and for May, 156,000. Despite the almost frenzied activities on the part of Ford, customers are having to wait on deliveries. Orders are said to have piled up, particularly for the two-door sedan, the bodies for which are being made both at Rouge and at the Briggs' plant. Ford has asked several steel companies how much tonnage they can supply during the second quarter, and large orders are expected to be placed by the Dearborn offices this week.

The fact that Ford is understood to have on hand at Rouge substantial tonnages of flat-rolled steel may hold down the volume of second quarter steel business originating at Rouge.

Chevrolet Has Large Unfilled Orders

At the same time that Ford is preparing to maintain relatively high production during the second quarter, Chevrolet is bending every effort to raise its assemblies, especially on the Master series of passenger cars. On account of the delay in securing bodies, Chevrolet is understood to have on hand unfilled orders for more than 200,000 units. It will not achieve peak operations until April or May. Its second quarter output promises to be far ahead of assemblies this quarter.

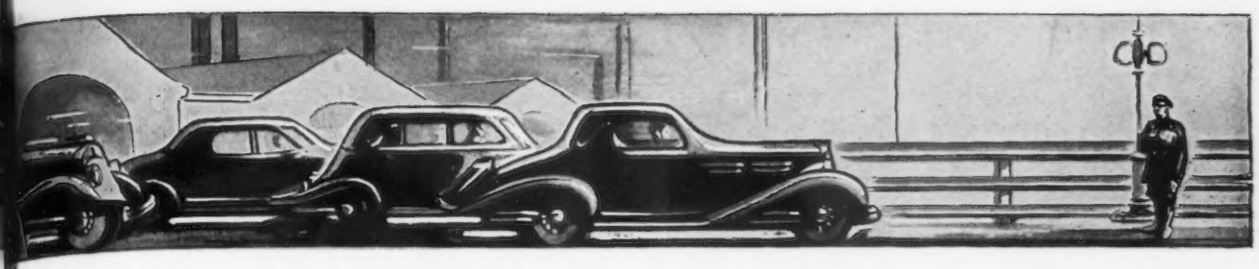
Chevrolet had set up a schedule of 60,000 Masters, 30,000 Standards and 15,000 commercial cars and trucks for March, but it is reported that a shortage of bodies will make impossible the attainment of those figures, particularly on the Master jobs. However, Chevrolet probably will get 80,000 to 90,000 units this month, with a substantial increase promised in April.

Chevrolet is reputed to have parts built ahead for 100,000 cars. This means that its steel purchases for the second quarter will be considerably below its actual assemblies of cars and trucks.

While Chevrolet continues to lag, Pontiac and Oldsmobile are going places. The former is turning out nearly 4000 cars a week and is shooting for 21,000 this month, although it is likely to fall short because of limited production of bodies. Oldsmobile proudly is referring to February as "a red letter month." It made over 14,000 cars then, for an all-time record. On Feb. 25 it manufactured 852 cars, the best previous figure for a single day having been 709 on April 26, 1929. In the first 20 days of the month its dealers sold 6943 cars, a larger number than for the entire month of February in any other year. It is believed that Pontiac and Olds will carry on through at least April and May with slight, if any, abatement in operations.

Plymouth's Strategy Revealed

Plymouth is the only large-volume manufacturer which has found it necessary to curtail activities. From an abnormal basis of six days a week, its assemblies went down to five and a half days and now are at five days. Why this has occurred is plain. Chrysler executives last November got



ASSEMBLY LINE

wind of Chevrolet's troubles and knew that Chevrolet dealers would not have adequate stocks for several months. They likewise were aware of Ford's plans for putting on production pressure early this year. Consequently, according to the story, they gave out the word for "full speed ahead" and by the end of February Plymouth had made more than 115,000 1935 models.

Further stimulus to extraordinary production was provided by the labor situation. At the time of the glass strike, the Chrysler divisions are said to have been caught with meager glass stocks, and if glass manufacture had been long interrupted, Plymouth operations would have been seriously jeopardized. The labor situation in Toledo, where a considerable volume of Chrysler parts is made, has been anything but healthy. Then the American Federation of Labor was talking belligerently about resorting to strikes in various automotive plants. The natural thing to do was to see that dealers got sufficient stocks, and that was what Plymouth did.

Despite the lag in Plymouth assemblies, which currently are said to be around 1700 to 1800 units a day, 42,874 cars were built in February. Plymouth is trying to stimulate retail demand by introducing two standard models, a business coupe at $510 and a two-door sedan at $535. These prices are still well above similar models of Chevrolet and Ford. Chevrolet's Standard coupe lists at $465 and the two-door at $485; Ford's prices are $495 and $510, respectively.

Plymouth is taking in parts and materials as scheduled and is reported to be building over 2200 motors a day. Its March output probably will be around 40,000 cars. Daily assemblies are picking up somewhat as the month advances. Dodge this week will smash all records for recent years when it turns out 1000 cars a day. Chrysler

BY BURNHAM FINNEY

Detroit Editor, The Iron Age

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Corpn's production last month of 80,277 units was the largest for any February in its history, and compares with 82,876 units in January.

February was the best month in four years for Graham-Paige, with assemblies having amounted to 3717 cars. This month Graham will build 4500 cars. Packard is turning out about 100 cars a day of its 120 series and hopes to step up the rate to 4000 a month. It is making 700 to 800 of its larger cars a month. Hudson operations, which have been off somewhat from previous levels, are said to be rising again.

Second Quarter to Exceed First

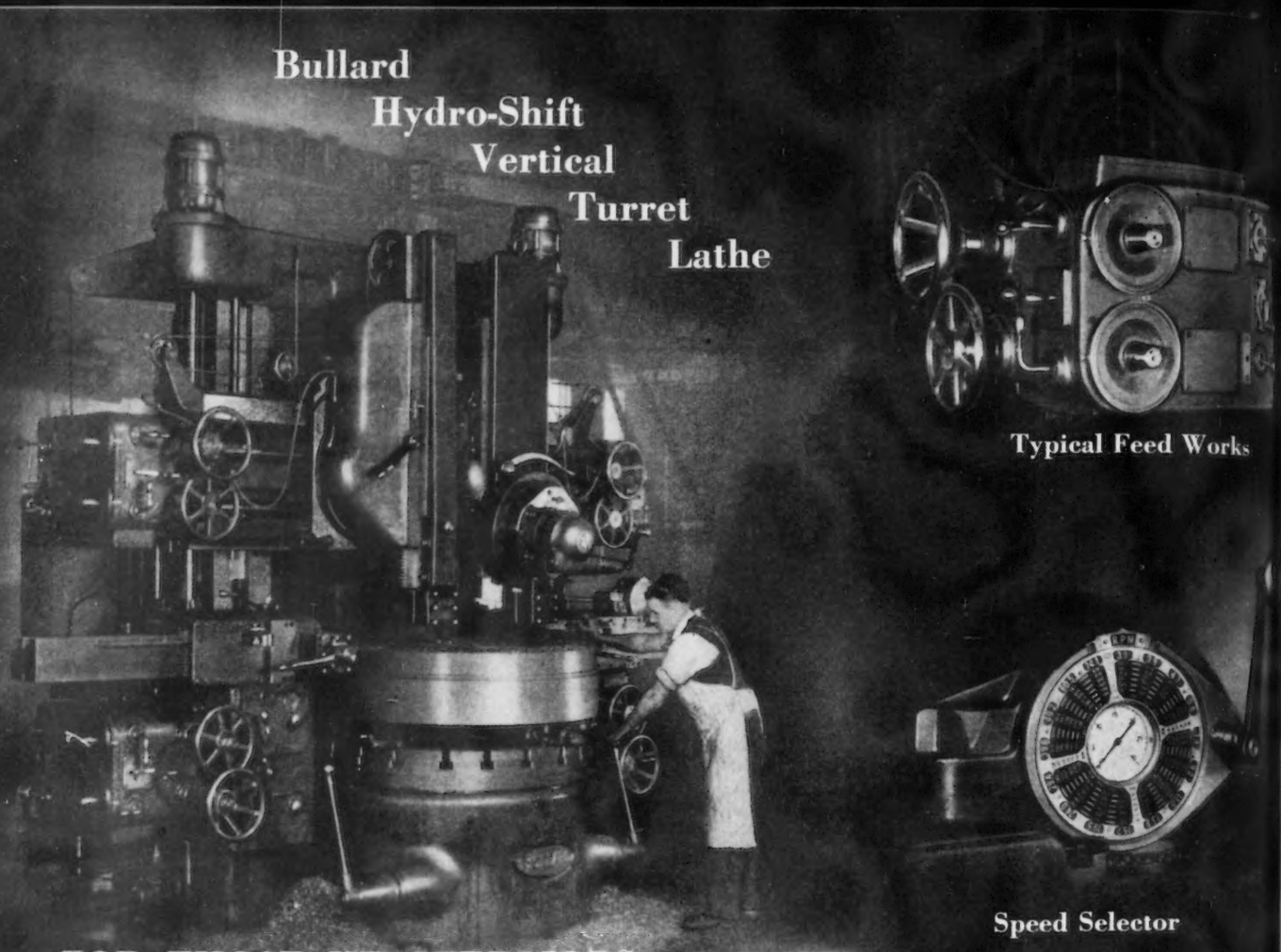
What is the second quarter outlook? An examination of the production figures for the last 10 years reveals the interesting and hopeful fact that never has the second quarter failed to show a marked improvement over the first quarter. The smallest gain was in 1926—13 per cent. The biggest jump was 83 per cent in 1933, which really should be stricken out of the records because the national bank holiday created an artificial condition. For the sake of conservative calculations, therefore, that year has been eliminated in figuring out that in the period from 1925-1934 inclusive the average increase in output in the second quarter as against the first quarter was almost 29 per cent. Members of the industry can't see why all previous performances should be upset this year.

Production figures for the industry line up about as follows: February is now estimated at 350,000 units and March at 400,000. April will top March by a small margin. May looks good for a volume not far below April.

Heavy Demand for Wide Sheets

Although automotive plants have enough steel that they are not worrying about tomorrow's supply, as they were several weeks ago, they already have furnished steel mills with a gratifying tonnage for April rolling. Large users like Fisher Body have placed orders covering most of their requirements through next month, whereas they usually have been content in the last few years to order not more than three or four weeks in advance. Tentative reservations already made and which shortly should be confirmed by actual releases promise to take all of the steel industry's wide sheet tonnage for the entire second quarter. A prominent flat-rolled steel company expects that within the next week or two practically all of its cold-rolled sheet production during April and May will be engaged.

The strike vote ordered in 176 local unions by the national council of the United Automobile Workers is not taken too seriously, since the results are hedged in by "buts," "ifs" and "ands." Only paid-up members will be allowed to vote, and a three-fourths vote is essential in order to declare a strike in any local union. Even then, only the national office of the Federation can authorize a walkout. President Green has requested a conference with Alfred P. Sloan to negotiate for employees of General Motors, and the strike vote evidently is held as a threat to strengthen the former's position. Local union leaders emphasize Mr. Green's statement in Detroit 10 days ago that "we organize for peace, but will not stop workers from striking if it is the only way they can get results." Perhaps an important automotive executive shrewdly and correctly sized up the situation when he characterized the strike program as an "A. F. of L. sales promotion campaign."



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It's difficult to impress the TRUE Importance of refinements of design and construction. Therefore, we call attention to the fact that the wide and varied experience of users has been a guiding factor in producing the highly developed Bullard Hydro-Shift line of Vertical Turret Lathes in sizes 46 - 56 - 66 - 76 - and 86 inches.

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THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

THIS WEEK IN WASHINGTON

Senate investigators will open NRA oyster to examine its "works," but more gently than extremists would wish.

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Federal boycott is lifted from Ford in spite of absence of blue eagle.

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Weirton decision upsets 7-a applecart, but A. F. of L. hastens to restore the spilled fruit with the help of Senator Wagner.

o o o

American steel workers jobs are given to Belgium in return for reciprocal trade pottage.

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Existence of capital goods overproduction before the depression is challenged by Conference Board Facts.

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BY L. W. MOFFETT

Resident Washington Editor, The Iron Age

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WASHINGTON, March 5.—Success of the Administration in maneuvering into the hands of the Senate Finance Committee the impending investigation of NRA probably means that it and "big business" will not be subjected to as raking a fire as would undoubtedly have been directed toward them had the investigation been taken up by a subcommittee proposed by such Senators as King and Borah of Utah, Nye of North Dakota and McCarran of Nevada. These Senators, who are hostile to NRA and most certainly willing to kill it, had sought a sweeping inquiry into the entire operation of NRA and were prepared to center attacks on alleged monopolistic practices they charge are engaged in by "big business" under codes.

It is not certain, however, that much muckraking of business is not in store for industry under the investigation by the Senate Finance Committee, but it will likely be much less virulent than the four Senators had in mind in previously urging separate NRA inquiries. One plan which was under way and may still be adopted is to go into the steel basing point system. It was proposed to use so-called evidence gathered by the unlamented Darrow board and to call steel makers.

The basing point system is a favorite political football and is always ready meat for consumption by voters. At least the politicians think so. The subject has been revived by the NRA and Federal Trade Commission reports are so far apart that the President had to abandon the effort to have them "coordinated." The commission report went to the White House Dec. 1, 1934. The NRA report, itself said to be the object of difference within NRA, was kept at the Blue Eagle roost until last week when it finally was sent to the White House. What disposition the President will make of the reports is not known.

In some quarters it is understood efforts are being made to send the two reports to Congress and urge legislation to abolish the basing point system as it now operates and replace it with an f.o.b. mill basing point system. On the other hand the Administration is earnestly trying to seek recovery. It would be even further retarded and the already great confusion

arising from legislative proposals would be increased by this action. For that reason there is doubt that the Administration would sponsor such a program.

Senator Pat Harrison, chairman of the Finance Committee, and strong Administration supporter, has said that "full, open and complete hearings" into the practices of the recovery administration and the operation of codes will be held. But they promise to be considerably less of a mere scolding and heckling agitation than was plainly indicated by the opponents of NRA. Nevertheless there is a rising opposition to many phases of NRA and its extension as proposed by the Administration is not the certainty that heretofore was taken as a matter of course.

Hearings and More Hearings

The Weirton Steel Co. decision set badly with organized labor advocates in Congress. Partly as a means of striking back and partly because of the mania for holding them, hearings on the Wagner labor disputes bill have been scheduled beginning March 11 before the Senate Committee on Education and Labor of which Senator Wagner is chairman. The House Committee on Labor, headed by Representative Connery, who is sponsoring the 30-hr. week bill, will begin hearings on the Wagner bill on March 12.

These double-barreled hearings undoubtedly will see organized labor swinging into action again against the employee representation plan. The Wagner bill would outlaw "company dominated" unions, and naturally organized labor will make the most of it as a sort of balm for its hurt feelings arising from the Weirton decision which okayed the employee representation plan. The Wagner bill was the object of long drawn out hearings at the last session of Congress. It is hard to conceive that anything new could be offered. But agitation being the order of the day hearings fit into the picture.

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Bronze Company Did Not Violate Section 7(a)

Reversing the Regional Labor Board for the fourth district, the National Labor Relations Board

A Proposed Stimulant for Capital Goods

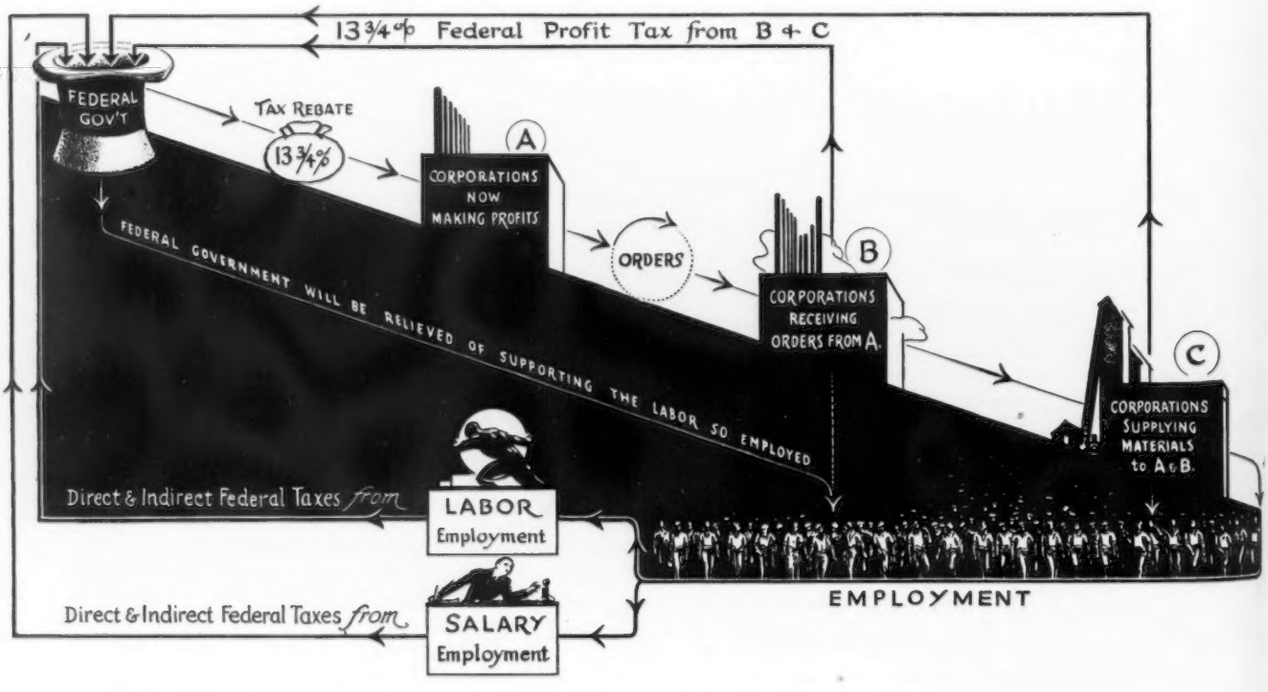
THE accompanying illustration picturizes a plan suggested by Henry A. Wise Wood for stimulating demand and employment in the capital goods industries. Briefly, this plan involves a temporary exemption from Federal taxation of such net earnings as are invested in new equipment and plant rehabilitation.

To illustrate, take the case of a corporation which invests $1,000,000 for these purposes. It would then be permitted to claim an exemption to the amount of $137,500 representing the Federal tax of 13¾ per cent.

Virtually as a stimulus to buying, this would be equivalent to a similar reduction in the price of the equipment purchased.

The concerns receiving the orders for the equipment would as a consequence purchase additional materials and employ more labor. It has been estimated that each $1,000,000 so spent would furnish additional employment for 400 men for one year.

The labor so employed, as well as the concerns receiving orders for equipment, would contribute to Federal income through many avenues of direct and indirect taxation. It is thus estimated that the Government would not be out of pocket after the completion of the cycle, because of the secondary tax returns generated and because men so put to work would be taken off relief rolls and Federally financed public works.



has found that the Johnson Bronze Co., New Castle, Pa., did not violate Section 7 (a) in laying off five employees. The board concluded that the employees had not been laid off because of union affiliations but because of diminished business activity. The board recommended that the company give adequate publicity to its method of determining seniority ratings, concluding that the complaints were filed by the employees chiefly because of an apprehension that seniority ratings were not being properly followed in lay-offs.

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Government Makes Way For Henry Ford

Back in its early days when NRA was pitched to the heights of a holy crusade, the fervent administrator, Hugh S. Johnson, predicted "economic death" for industrialists who were without the Blue Eagle. The first major run-in the fiery general had with an important industrialist was with Henry Ford. Mr. Ford declined to sign the automobile code; his signature still is missing and no doubt always will be.

Mr. Ford is still doing business, a lot of it, selling cars that are Blue Eagle-less, and complying with all code provisions. The Government is now lifting its boycott on Mr. Ford. The executive order of March 14, 1934, requiring certificates of compliance, which in turn called for code signature, as a requisite to getting Government awards, is being modified so the Ford company can sell to the Government. War Department schedules for large quantities of trucks, sedans and ambulances have been revised and sent out in anticipation of the forthcoming change in the executive order and clearly open the door for Mr. Ford to do business with the Government.

So Mr. Ford is in.

General Johnson is out.

The NRA has sagged from its old crusading heights to the depths of a snake's chin and the Blue Eagle truly has become a thunderbird. What sort of transition has taken place in this much ballyhooed alphabetical agency?

Evolution?

Revolution?

Dissolution?

• • •

Urges Passing of Federal Cost Accounting Bill

Speaking for the National Association of Manufacturers and two-score other organizations which joined in a common appeal, James A. Emery, general counsel of the association, has urged Congress to enact the Clark-Shannon Federal Cost Accounting bill to protect American industry from the "over 225 forms of Government competition with private citizens." Mr. Emery appeared before a subcommittee of the Senate Committee on Commerce in connection with S. 1, "a bill to provide for the establishment and maintenance of a procedure for cost accounting and cost reporting for Federal agencies." The Senate bill is by Senator Clark of Missouri, and a companion bill was introduced in the House by Representative Shannon, also of Missouri.

Directing attention to what he described as expansion of Government operations until they "threaten our national economy," Mr. Emery told the sub-committee that he was "firmly convinced that Congress stands at the parting of the ways, for either it will limit and return these Government activities to their appropriate place, or we shall inevitably establish within our Government the functions and objectives of a socialistic commonwealth."

A statement strongly supporting the Clark-Shannon bill for Government cost accounting for Government activities in competition with private business was placed before the Senate Committee on Commerce by the Chamber of Commerce of the United States. The Chamber held that such legislation would tend to reduce Government competition with private business, which, it declared, is frequently carried on in an unfair manner.

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Continental Can Election Ordered

The National Steel Labor Relations Board has ordered that an election be held under its supervision to determine the collective bargaining agency at the Continental Can Co. tin house at Clearing, Ill. Petition for an election was filed with the board by Clearing House Lodge No. 55, Illinois, of the Amalgamated Association of Iron, Steel and Tin Workers.

The board holds that a prior election held under the employee representation plan was not an election as is contemplated by the Congressional resolution under which the board was established. The order calls for an election by secret ballot within 10 days from the date of the order, the polling place to be selected by the representative of the board and tellers to be chosen by the Amalgamated association members and members of the employee representation group. Like former orders the company is asked to present its payroll within 10 days from the date of the order. In case of court action by the company it is requested that the payroll be presented within five days after the court decision.

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No Lodge, No Election!

Another battle at Fort Duquesne is on.

Originally fought between General Braddock's forces and a union of the French and the Indians, it is now a tussle within union forces. The union won on the first occasion because Braddock would not follow Washington's guidance.

Now the union forces are split and it remains to be seen what Washington will do about it.

Outlawed by the Amalgamated Association of Iron, Steel and Tin Workers, because its radical wing under William Spang held a rump meeting, the association wants Washington through the National Steel Labor Relations Board to call off the election it ordered at that plant of the Carnegie Steel Co. The association, in a petition filed with the board by its counsel, Charlton Ogburn, says there is no longer a Fort Dukane Lodge. The lodge was suspended by the association. Hence it wants the order for the election revoked.

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NRA Price Policy Announcement Near?

NRA may announce its price policy next week. This was held to be a possibility by a high official. He said, however, it was only a guess. It will be the first of several policies to be officially stated by the NRA, following hearings on major provisions of the code. The second hearing related to employment provisions. The next hearing will concern code administration.

Steel Board Orders Weirton Hearing

WASHINGTON, March 5.—The National Steel Labor Relations Board today ordered a hearing on March 18 in Washington on complaint of Mel Moore, member of Amalgamated Association of Iron, Steel and Tin Workers, that he had been discharged by the Weirton Steel Co. for union activity. It is reported that the charge was prompted in an effort to bring the Weirton Steel Co. before the board and in the courts again for alleged violation of Section 7-a following the decision last week by Judge Nields in Wilmington, which exonerated the company of violating the collective bargaining section of the recovery act.

Recovery Act Challenged and Employee Representation Upheld by Court

WASHINGTON, March 5.—Strongly upholding the company union as a proper agency for collective bargaining and declaring Section 7-a of the National Industrial Recovery Act to be unconstitutional and void, the decision last week by Federal Judge John P. Nields at Wilmington, Del., was a smashing victory for the Weirton Steel Co. and the employee representation principle. Simultaneously, Federal Judge Charles I. Dawson at Louisville, Ky., also directed a blow at the Government when he enjoined enforcement of the bituminous coal code on the ground that mining of coal is an intrastate operation. Judge Nields likewise held in the Weirton case that production of iron and steel is intrastate commerce and therefore is not subject to Government regulation.

These two decisions came shortly after one by Judge Grubb of the Federal District Court at Birmingham, barring the TVA from going into the electric power business. Pending before the Supreme Court of the United States is the Belcher lumber code case which involves the commerce clause of the constitution whose outcome will give a direct test by the highest court of the constitutionality of Section 7-a. Only recently the Government won a doubtful victory at the hands of the Supreme Court in the gold clause case.

All these cases were admittedly threats to the entire New Deal recovery program. While officials who commented on them sought to minimize the decisions by the District Federal Courts at Wilmington and Louisville, others clearly admitted that the Administration is face to face with a serious situation. Representatives of industry hailed the Weirton and coal case decisions, especially the former, as of the utmost importance. Organized labor declared the cases would, "if necessary," be fought through the highest court. Attorney General Cummings said that all of the New Deal cases eventually would be carried to the Supreme Court.

E. T. Weir Elated by Decision

THE valiant fight and brilliant victory in the Weirton case established Ernest Tener Weir, chairman of the National Steel Corpn. and of the Weirton company, as one of the outstanding industrial executives of the United States. In commenting upon the decision, Mr. Weir stated that it was "a complete vindication of our constant position that we have never in any way influenced or dominated our employees in the operation of their employee representation plan; that at all times they have had complete freedom of action, and have conducted their organization according to their own ideals.

"The decision," Mr. Weir added, "also decides the legality of employee representation and its outstanding value to employees in the matter of collective bargaining with their employers."

Government officials who made statements sought to make the point that the decisions were simply those of the lower Federal courts and affected confidence that reversals would come from the Supreme Court.

Wide Application Logical

In the Weirton case the decision gave the Weirton Steel Co. the right to conduct an employee representation plan and said that Section 7-a of the recovery act is unconstitutional and void. It gave to these unions the right to organize and select their own representatives for collective bargaining.

Blackwell Smith, chief NRA counsel, declared that the decisions were binding only in the cases involved, a view in sharp conflict with those of counsel representing industries. The latter made the point that inasmuch as in the steel and coal industries generally the same situation prevails as in the cases on which decisions have not been made and that therefore they are equally applicable.

The decisions added to the tangled legislative situation over extension of the recovery act, requested by the President. With the decisions thrusting at the constitutionality of Section 7-a, its continuance, sought by the Administration, offers a serious problem for Congress. The situation is complicated by the fact that there is a growing element, centering around but branching beyond the progressive blocs in both branches, which is opposed to extension of the recovery act at all.

Even going further than a threat to the NRA, the decisions plainly were directed against the theory of the Wagner labor disputes bill, which would outlaw "company dominated" unions, the 30-hr. work week bill, the Guffey bill for nationalization of the coal industry, and other pending legislation which would socialize the industries of the country.

Weirton Case Initiated Battle

The Weirton case was the first major proceeding affecting Section 7-a and challenging the authority of the old National Labor Board to be taken to the courts. From the outset it has been accepted as a test case of the power of the Government to assume jurisdiction over employer-employee relations. Judge Nields cast aside Government charges that the company had discriminated among its employees and interfered with them in elections and otherwise used alleged coercive methods to dominate labor in bargaining with the company.

The Court declared that an employee election held by the company was valid and that the Na-

E. T. WEIR, Drawn by John Frew for The Iron Age

tional Labor Board had no authority to conduct an election. The labor board was referred to as a "mere volunteer" that was "acting as a group of individuals and not as a lawfully constituted body." To the suggestion that recurrent hard times suspend constitutional limitations or cause manufacturing to so affect interstate commerce as to subject it to regulation by Congress, Judge Nields said that it "borders on the fantastic and merits no serious consideration."

Judge Nields cited four Supreme Court decisions in support of the company's contention that it is not engaged in interstate commerce with its employees. Relations between the company and its employees, the decision said, do not afford interstate commerce.

Precisely the same arguments have been made by counsel for other steel companies in labor cases before the National Steel Labor Relations Board. The board, however, has ordered several elections under its jurisdiction. Two of the cases, one affecting the Duquesne, Pa., plant and the other the McDonald, Ohio, mill of the Carnegie Steel Co., were the first taken to court as the outgrowth of the steel board decisions. They were appealed by employee representation groups. Other steel cases of a like nature are pending and the steel company and employee representation groups clearly have found their cases greatly strengthened by the Weirton decision.

Upheld On Every Point

On every point Judge Nields upheld the Weirton company's contention. "Manufacturing is a cooperative enterprise," he said. "Production in quantity and quality with consequent wages, salaries and dividends, depends on a sympathetic cooperation of management and workers. A relation acceptable and satisfactory to both workmen and management is an essential feature of the enterprise. If satisfactory, the court will not disturb it.

"It is said this relation involves the problem of economic balance of the power of labor against the power of capital. The theory of a balance of power, or of balancing opposing powers, is based upon the assumption of an inevitable diversity of interest. This is the traditional Old World theory. It is not the twentieth century American theory of that relation as dependent upon mutual interest, understanding and good will.

"This modern theory is embodied in the Weirton plan of employee organization."

Judge Nields held that the employee representation plan or company union "is a lawful instrument for collective bargaining under the act and is free of domination and control of management."

The National Steel Corpn., it was stated, is owner of the Weirton company, but was not a defendant in the case. Part of the business of the former was said to involve interstate commerce but it was added that the Weirton company was the sole defendant and that its business is the manufacture of iron and steel. As such, it was stated, it is not engaged in interstate commerce save to a negligible extent and not at all in its relations to its employees as dealt with in Section 7-a.

"Those relations are incident to manufacture," said the decision. "The fact that defendant is a wholly owned subsidiary of the National Steel Corpn. cannot change the character of the defendant's business from that of manufacture to commerce.

"Therefore, in considering the question of constitutionality of Section 7-a the business and corporate structure of the National Steel Corpn. is immaterial."

Citing Supreme Court decisions to support his position that manufacturing is not interstate commerce, Judge Nields added:

"The very thing emphatically condemned by the Supreme Court is what has been attempted by means of Section 7-a of the recovery act and the codes approved under them."

The Supreme Court child labor case was also cited: "This is a clear and emphatic statement that the commerce clause cannot be construed so as to bring within the regulatory power of Federal Government the manufacture of goods intended for shipment in interstate commerce and a *fortiori* the entire economic life of the nation," said the Court.

"The constitution did not give to Congress the power to regulate manufacture. The authority of these cases of the Supreme Court stands and must continue to stand until the constitution is amended. Their application to the business of the defendant is quite certain.

"If the defendant's manufacturing plants and manufacturing operations are to be regarded as instruments for the interstate movement of goods, it follows that practically all of the manufacturing industry of the United States would be brought within the control of the Federal Government.

"Such result has received the unqualified condemnation of the Supreme Court."

Manufacturers Association Approved

In the opinion of James A. Emery, general counsel, National Association of Manufacturers, the Weirton decision revives constitutional government in the United States. "It will promote rational employment," said Mr. Emery. "It conclusively refutes the misrepresentations of those who claimed the Weirton employees did not freely establish without interference their own plan of collective relations. It makes equally clear in accordance with a century of decisions that Congress cannot regulate manufacturing under the guise of regulating commerce.

"It sounds the death knell of the fundamental fallacies underlying the pending 30-hr. week bill, the Guffey bill and the Wagner labor disputes bill. It revives constitutional government."

NRA Minimizes

Blackwell Smith, on the day of the decision, sought to minimize the ruling. The opinion that manufacturing is not interstate commerce was held by Mr. Smith to be "outmoded." "As to the merits of the collective bargaining of the case," said Mr. Smith, "I do not have enough information to comment and of course defer to the Department of Justice and the National Labor Relations Board on this type of question.

"As to the position taken by the Court on constitutionality of Federal control of matters involving manufacturing, the decision as reported to me seems clearly to be based on an outmoded theory of constitutional law. It seems to me that there is no cause for concern on this count in view of the realistic approach of modern industry and commerce shown by the Supreme Court in recent decisions, particularly the Appalachian Coals case.

"I assume there will be a prompt appeal and I have no doubt as to the outcome on the constitutional question."

In the Appalachian Coals case, Mr. Smith explained, the Supreme Court said Congress had the power to prevent wells of commerce from going dry. It can have the same approach, he stated, as to manufacturing. The theory that manufacturing is not commerce, Mr. Smith, declared, "is left high on the beach. The Weirton case, he said, was an equity case and the next step was assumed to be to the Circuit Court of Appeals. Mr. Smith said he believed it would be impossible to get the case before the Supreme Court at its present session.

Reciprocal Trade Agreement Provides For Large Reductions on Steel Duties

WASHINGTON, March 5.—Reductions ranging from $1.12 to $3.36 per gross ton on certain steel products are provided in the American-Belgian reciprocal tariff agreement signed on Feb. 27. It marks the first agreement of the kind in which concessions in iron and steel duties have been made by the United States Government. The two previous pacts, made with Cuba and Brazil, did not affect the rates in the American tariff on iron and steel.

The new pact opens the way for similar agreements with other highly industrialized countries which are strongly competitive with the United States in the iron and steel markets of the world, and, with their low wages and costs, promise wider penetration of the American market, especially along the Atlantic seaboard.

The lowered duties on iron and steel granted to Belgium are automatically made available to all iron and steel manufacturing countries giving "most-favored-nation treatment" to the United States. Probably Russia alone is barred from the advantage of the concessions by reason of the recent impassé in negotiations between the American and Soviet governments. The exclusion of Russia is not important as it is not a factor in American iron and steel imports.

Effective in 30 Days

The agreement is to become effective 30 days after proclamation by the President and simultaneous official publication in Belgium. It is understood that two or three weeks will elapse before the proclamation is issued in order to give time to determine clearly what countries may not be entitled to "most-favored" treatment and therefore to the concessions.

Reciprocal tariff agreements are negotiated by the State Department under the authority given the President to conclude such pacts. Under this authority the executive can fix tariff duties without Congressional sanction so long as they are not more or less than 50 per cent of those enacted by Congress.

In hailing the American-Belgian agreement as a precursor to "a healthy and most desirable increase in trade between the two countries," Acting Secretary of State Phillips said the iron and steel duty concessions affect seven low-priced or tonnage grade products. Actually, the grades involved cover a broad range of raw and finished lines with which in the past the United States steel industry encountered serious and now is encountering important competition with European countries and especially with Belgium.

Products Important

The seven "products" referred to by the State Department really cover seven classifications in the iron and steel tariff schedule. Lines on which concessions were granted include muck bar, ingots, blooms, slabs, bar iron, billets, merchant steel bars, concrete reinforcement bars, shafting, steel castings, sheets and plates, fabricated shapes, hoops and bands and wire rods. The lowest reduction of $1.12 in duties applies to the lower priced products in these lines, while the maximum slash of $3.36 applies to high-grade sheets, importations of which have not been large, thanks to the superiority of American quality.

Belgian imports of the affected products aggregated only 29,050 gross tons in 1934, compared with 36,165 in 1933. In pre-depression years they have been much heavier and have related principally to structural material, steel bars and hoops and bands. The latter two items constituted the bulk of importations last year and the year preceding, amounting to 11,959 and 11,861 tons respectively. The duty on hoops and bands was cut from 0.25c. to 0.2c. per pound.

While in themselves these importations are not large, they measure up importantly when the condition of the American market is taken into consideration with its relatively small requirements. Moreover, the lowering of the duties for Belgium and other "most-favored" treatment-countries, with their wages much below the American level, with exchange markets distorted, and with the American industry committed under the recovery act to maintenance of high wages and shortened hours in the face of extremely dull markets except in a few lines, offers a serious threat to wider invasion of foreign steel into the United States.

NRA itself has set up a division to protect American industry against such a development. Going in the opposite direction, the State Department is zealously trying to break down what Mr. Phillips calls "these extremely high duties." The State Department complacently assumes "that whatever new competition may present itself can be ably met by American industries." It becomes highly impatient whenever objections to its pacts are registered by American industries.

State Department's Alibi

In its statement regarding the American-Belgian agreement, the State Department commented on the changes applying to iron and steel products as follows:

"Concessions were made to Belgium on seven low-priced or tonnage grade iron and steel mill products. Transportation costs on these items are so high in comparison with their value that the areas within which they can be marketed is restricted. At least two of the items included here are usually purchased by the small mills for use as raw materials in the manufacture of finished products. In the case of only one of the five of the seven items did imports constitute as much as one per cent of domestic production in 1933; in fact, imports of one of these items (steel ingots, blooms and slabs) were equivalent to 0.004 per cent of domestic output."

The State Department, in this statement, appears unconcerned as to the effect of imports in the "areas within which they can be marketed," but producers along the Atlantic seaboard no doubt are concerned. The comparison of Belgian imports with production is looked upon as far-fetched. It doesn't make the more important comparison with production where competition was the keenest. Nor does it make the point of the potential increased competition, not alone from Belgium, but from other iron and steel countries. In some of the countries wages are not much above the coolie level.

However, the State Department actually manifests a degree of apprehension over the concessions and their effect on the American market. This is indicated by a number of provisions in the agreement. They are designed to permit the modification or termination of the agreement in the event of a wide variation in the rate of exchange between the currencies of the two countries, or in the event that as a result of the extension to third countries of the concessions the third countries should obtain the major benefit of the concessions and an unduly large increase in importations should result.

"With reference to the latter provision," the State Department announced, "the considerations underlying its inclusion in the agreement are as follows: Apprehension

has at times been expressed that as a result of generalizing concessions to third countries in accordance with the principle of unconditional 'most-favored-nation' treatment, the concessions made under our trade agreements may result in an undue influx of imports from 'low cost' countries. These fears, it is believed, are exaggerated since concessions are granted by the United States on products of which Belgium is the chief source or is among the leading sources of imports into the United States.

"Nevertheless, as a precautionary measure, to safeguard the interests of American industries, provision has been made whereby the concession granted to Belgium on any product and extended to third countries may be withdrawn if it should develop that the above expectations are not well-founded."

Provision is also made that treaties may be denounced after six months' notice.

Procedure of Agreement

In outlining the procedure followed in arriving at decisions with respect to reciprocal tariff agreements, the State Department said that careful consideration is given to oral and written representations made through the Committee for Reciprocity Information by interested parties in the United States both for and against making a concession.

Many industrialists have complained that the Government policy in effect amounts to star chamber proceedings and that little or no attention is paid to protests from them.

The precaution the State Department assumes in the agreement hardly accords with the statement given out by Acting Secretary Phillips who sees in the lowering of duties on building materials a lowered price structure that will stimulate building. It is not made clear whether these materials will be foreign goods or whether the threat of increased importations will bring down the domestic price. Nor is it explained whether prices can be brought down or not because of the straitjacket of Government control through NRA as to wages and hours, a jacket that is not worn by foreign competitors.

Users May Benefit

In any event, Mr. Phillips in the course of his comment said: "The lowering of some of these extremely high duties should prove of benefit to wide circles of American users. This is particularly important in connection with the duty changes on various building materials such as cement, plate glass and low priced or tonnage grade iron and steel products because of the importance of these materials in building construction. In all these instances, a lowered price should help to stimulate both urban and rural building, make it less costly to enter upon new building and repair operations, and thereby facilitate the general spread of

PROPOSED DUTIES ON IRON AND STEEL PRODUCTS IN BELGIAN-AMERICAN RECIPROCAL TRADE AGREEMENT COMPARED WITH EXISTING DUTIES

	Proposed rates	Present rates	Reduction per gross ton
Muck bars, pieces thereof except crop ends, bar iron, and round iron in coils or rods, iron in slabs, blooms, loops, or other forms less finished than iron in bars and more advanced than pig iron, except castings; all the foregoing valued at not above 1½c. per lb.	0.25c.	0.3c.	$1.12
Steel ingots, cogged ingots, blooms and slabs, by whatever process made; billets and bars, whether solid or hollow, weighing more than 30 lb. per linear ft. Valued at not above 1½c. lb.	0.25c.	0.3c.	1.12
Valued above 1½ and not above 2½c.	0.375c.	0.05c.	2.80
Billets and bars, whether solid or hollow, weighing not more than 30 lb. per linear foot, and concrete reinforcement bars:			
Valued at not above 1½c. per lb.	0.25c.	0.3c.	1.12
Valued above 1½ and not above 2½c.	0.4c.	0.5c.	2.24
Die blocks or blanks; shafting; pressed, sheared or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun-barrel molds not in bars; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates and steel not specially provided for; all the foregoing:			
Valued at not above 1½c. per lb.	0.25c.	0.3c.	1.12
Valued above 1½c. and not above 2½c.	0.4c.	0.5c.	2.24
Boiler or other plate iron or steel, except crucible plate steel and saw plate steel, not thinner than one hundred and nine one-thousandths of one inch, cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at not above 3c. a lb.	0.35c.	0.5c.	3.36
Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel, valued at 3c. per lb. or less:			
Thinner than one hundred and nine one-thousandths and not thinner than thirty-eight one-thousandths of one inch	0.35c.	0.45c.	2.24
Thinner than thirty-eight one-thousandths and not thinner than twenty-two one-thousandths of one inch	0.45c.	0.55c.	2.24
Thinner than twenty-two one-thousandths and not thinner than ten one-thousandths of one inch	0.60c.	0.75c.	3.36
Thinner than ten one-thousandths of one inch	0.70c.	0.85c.	3.36
Corrugated or crimped	0.60c.	0.75c.	3.36
Beams, girders, joists, angles, channels, car-truck channels, tees, columns and posts, or parts or sections of columns and posts, and deck and bulb beams, together with all other structural shapes of iron or steel; any of the foregoing machined drilled, punched, assembled, fitted, fabricated for use, or otherwise advanced beyond hammering, rolling, or casting	15%	20%	25%
Hoop or band iron, and hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for baling cotton or any other commodity	0.2c.	0.25c.	1.12
Wire rods: Rivet, screw, fence, and other iron or steel wire rods, whether round, oval, or square, or in any other shape, nail rods and flat rods up to six inches in width ready to be drawn or rolled into wire or strips, all the foregoing in coils or otherwise, valued at not over 4c.	0.25c.	0.3c.	1.12

United States Imports of Belgian Steel on Which Duties Have Been Reduced

(In Gross Tons)

	1934	1933
Ingots, etc.	705	258
Concrete reinforcement bars	1,255	2,529
Merchant steel bars	9,914	13,779
Wire rods	1,332	648
Boiler and other plates	250	211
Sheets, skelp and saw plate	3,395	6,727
Hoops and bands	11,959	11,861
Fabricated shapes	240	152
Total	29,050	36,165

business recovery. It is believed that whatever new competition may present itself can be ably met by the American industries."

The automobile industry expressed gratification over the agreement. It provides for a reduction of 15 per cent in the Belgian duty on passenger cars. Reductions in duty on automobile parts vary from 64 to 80 per cent on 11 classifications of parts on which duty decreases have been granted. However, including 14 classifications of parts on which Belgium offered no duty decreases, the general cut on all automobile parts amounted to 50 per cent.

In addition to getting concessions in Belgium duties on its products, the concessions granted by the American Government cover important items used by the automotive industry.

Inland Steel To Rebuild Bloomer

ANOTHER indication that 1935 may be the greatest "building" year in the history of the steel industry has appeared with the announcement by J. S. Ervin, president, Mackintosh-Hemphill Co., Pittsburgh, that his company had received an order from the Inland Steel Co., Chicago, for construction of new blooming mill equipment.

Mr. Ervin announced that work will begin immediately on the Inland project, which is a 36-in., two-high, reversible, electrically-operated mill. This and other recent orders obtained by Mackintosh-Hemphill will provide additional and steadier employment for workers at the company's plants in Pittsburgh, Midland, Pa., and Wooster, Ohio.

The Inland order is the second large contract for mill construction announced by Mackintosh-Hemphill in less than a week's time. The Jones & Laughlin Steel Corpn., Pittsburgh, has just ordered a blooming mill as a part of its $4,500,000 program for rebuilding its Pittsburgh plant.

Railroad Car Builders Offer Important Code Amendment—Other NRA News

WASHINGTON, March 5.—In an effort to overcome a practice deemed "obnoxious" representatives of the railway car building industry have offered an amendment to the code prohibiting making allowances from the base price for any product if materials are furnished by the customer, in this case only railroads. The amendment also carries a clause prohibiting making of quotations for processing for completed articles requiring new materials if the customer either furnishes the materials or directs the employer to purchase from a source of supply designated by the customer.

N. A. Stancliffe, New York, counsel for the car builders code authority, has declared that the purpose of the amendment is to eliminate the possibility of one builder "succumbing to the importunities or blandishments" of railroad purchasers in making contracts. "When this does happen," he said, "it must of necessity follow that all other competing car builders must fall to the same level in making bids. This is an unfair practice as between customer and employer and between employers."

Research and Planning Adviser Thomas P. Kelley has disapproved the proposed amendment on the grounds that the railroads should be protected in their position of being able to buy materials cheaper than car builders, although he said he admitted that railroads do enjoy a better bargaining advantage insofar as staple materials are concerned.

Mine Car Exemption Asked

Public hearing will be held March 18 at the Carlton Hotel on the application of the Southern Car & Mfg. Co., Birmingham, for exemption from the code for the mine car manufacturing industry. The Southern company contends that it did not participate in establishment of the code; that a majority of mine car manufacturers are in the competing Pittsburgh territory and that steel prices and freight rates give them an advantage over the petitioning company; that the code's price filing requirement would disrupt the company's established business relationship; and that the code's wage and hour provisions would impose labor standards above those prevailing in the Birmingham district. The company asks that it be permitted to operate under the code for the fabricated metal products manufacturing and metal finishing and metal coating industry. The mine car manufacturing industry is a subdivision of the machinery and allied products industries.

Job Galvanizing Metal Coating: The supplementary code authority for the job galvanizing metal coating industry, a division of the fabricated metal products manufacturing and metal finishing and metal coating industry, has made application for approval of a $10,280 budget to cover code administration expenses from Nov. 28, 1934, to June 16, 1935. The rate of assessment from industry members would depend upon the proportion that a member's 1934 sales bear to the total net sales made by the entire industry for that year provided that the rate shall not exceed one-third of one per cent of total industry sales.

The NIRB has approved amendment to Article VII, section (c) of the code of fair competition for the same industry providing for observance of an individual manufacturer's own current net price lists, or price lists and discount sheets in selling his products. The amendment will become effective March 25.

Lead Industry: A stay of the hours provision of the lead industry's code, to permit a maximum working period of 16 hr. in 24 to meet the occasional requirements of changing shifts, has been extended 60 days by the NIRB. The extension was effective Feb. 16, when the stay would have expired. The extension may be terminated upon approval of a code amendment carrying out the purpose of the stay. An amendment on the subject has been submitted to NRA by the code authority.

Complete Wire and Iron Fence: The NIRB has approved an amendment to the supplementary code for the complete wire and iron fence industry, a subdivision of the fabricated metal products manufacturing and metal finishing and metal coating industry, providing that provisions of Article VII, dealing with price lists, shall not apply to sales of articles for export.

Boiler Manufacturing: James D. Andrew, of New York, manager of the boiler manufacturing industry code authority, has formally submitted for NRA approval a group of code amendments covering price filing changes and a liquidated damage plan for protection against code violations. In an explanatory statement, Mr. Andrew pointed out that the only change from the existing section would be to require members to file price terms in addition to price lists "in order to stabilize prices."

Die Casting: The code authority for the die casting manufacturing industry has made application for approval of its $16,300 budget and the basis of contribution for the period from March 18, 1935, to March 18, 1936. The proposed basis of assessment is one-fourth of 1 cent per hr. on all man hours worked, except die making man-hr.

Foundry Equipment: The code authority for the foundry equipment industry has made application for approval of its

$4,983.96 budget, and the basis of contribution, for the period from Jan. 1, 1935, to June 16, 1935. Annual assessment against each member of the industry is on the basis of 0.3 per cent of all annual sales (including repair parts), averaged for the preceding five calendar years; the assessment to be pro-rated and approved for 5½ months, or, until June 16, 1935.

Roofing and Sheet Metal Contracting: The code authority for the roofing and sheet metal division of the construction industry has applied for approval of several amendments to its approved code of fair competition. The amendments are designed to define more clearly the scope of work coming under this branch of the industry, and to modernize the code's provisions to the point where they are brought more nearly into line with the practices prescribed in other codes more recently approved. Copies of the proposed amendments are available at the office of the NRA, room 624, Albee Building, Washington.

Code Authorities Approved

The NRA has approved the following code authority members:

Conveyor and Material Preparation Equipment Manufacturing Industry: F. C. Morrow, Morrow Mfg. Co., Wellston, Ohio; H. L. Donahower, Standard Conveyor Co., N. St. Paul; W. S. Lister, C. O. Bartlett & Snow Co., Cleveland; George P. Torrence, Link-Belt Co., Chicago; D. B. Pierson, Stephens-Adamson Mfg. Co., Aurora, Ill.; W. B. Greene, Barber-Greene Co., Aurora, Ill.; and William H. Jaenicke, Mailler Searles, Inc., San Francisco.

Railway Appliance Manufacturing Industry: W. F. Kasper, Fairmont Railway Motors Inc., Fairmont, Minn.; F. E. McAllister, Kalamazoo Railway Supply Co., Kalamazoo, Mich.; and C. H. Wilson, Fairbanks Morse & Co., Chicago.

Open Steel Flooring (Grating) Manufacturing Industry: H. B. Loxterman, Blaw-Knox Co., Blawknox, Pa.; H. H. Bunker, Kerlow Steel Flooring Co., Jersey City, N. J.; B. L. Fralick, Universal Mfg. Co., Novi, Mich.; W. J. Hamilton, Hendrick Mfg. Co., Carbondale, Pa.; W. P. Ladd, Gary Structural Steel Co., Gary, Ind.; C. H. Lewis, Irving Iron Works, Inc., Long Island City, N. Y.; and A. E. Sangdahl, William P. Klemp Co., Chicago.

Auto Rebuilding & Refinishing Trade: Harry A. Wolfington, Alex Wolfington Son, Inc., Philadelphia; John F. Banthin, Banthin Body Co., Bridgeport, Conn.; Albert Adler, Portchester Auto Radiator & Body Works, Portchester, N. Y.; Harry Nadworny, Nadco Inc., Bronx, N. Y.; James B. Allen, Battle Creek Auto Body Co., Battle Creek, Mich.; Carl Butterfield, Automobile Coach Co., Inc., Kansas City, Mo.; David McLaren, McLaren Automotive Services, Inc., Pasadena, Cal.; O. V. Hoke, Charlotte Wagon & Body Works, Charlotte, N. C.; and Maxwell Yingling, Yingling Auto Works, Hagerstown, Md.

Chain Manufacturing Industry: T. E. Newbold, Bradlee & Co., Inc., Philadelphia, to succeed Adolph Kurz, deceased.

Edgcomb Steel Corpn., Newark, N. J., has been made a distributer of stainless steel sheets, plates, and strip made by the American Rolling Mill Co., Middletown, Ohio, and will serve customers either from warehouse stocks or by direct mill shipment.

No Overproduction of Capital Goods Before Depression, Says Jordan

THE statistics of the value of output of consumers' goods, producers' goods and construction from 1914 to 1933 show that there is no basis for the prevalent theory that an unduly large proportion of the national income of the United States was saved and directed into capital formation and the creation of producers' goods in the pre-depression period.

A study by the National Industrial Conference Board, says Dr. Virgil Jordan, its president, gives no evidence that any marked shift had occurred from 1914 to 1929 in the relative share of producers' and consumers' goods in the total value of output of all goods and of all types of construction.

In 1914, the value of construction accounted for 22.3 per cent of the total value of all goods produced and of construction completed in that year. In 1919, the share of construction was 15.1 per cent. In 1921, it was 17.8 per cent. The 1914 ratio was restored in 1923, and it remained practically unchanged until 1931. In 1933 the value of construction declined to only 15.0 per cent of the combined value of output of all goods and construction.

There is no evidence in these figures that during the post-war period too much capital went into construction and too little into the production of various types of goods. There is no indication of relative overbuilding before the outbreak of the depression. The unusually low share of construction in the total value of output in 1933, on the other hand, points to the need of restoring this industry as a necessary condition of economic recovery. In 1933 the value of construction was only 30.7 per cent of the 1929 figure and 85.9 per cent of the value of construction in 1914. The value of all goods produced in 1933 was 43.9 per cent of the 1929 amount and 127.8 per cent of the 1914 figure.

From 1914 to 1929 the value of consumers' goods fluctuated between 59.2 per cent and 64.1 per cent of the total value of production of all goods and construction. The high point in the proportion of consumers' goods was reached during the depression of 1921. From 1923 to 1929 the value of consumers' goods fluctuated only between 59.2 per cent and 59.7 per cent of the total value of all output. During the same period the value of producers' goods fluctuated between 17.1 per cent and 18.8 per cent of the total value of all goods and construction. During the current business depression the proportion of consumers' goods in the total output increased greatly. In 1931 these goods accounted for 63.7 per cent and in 1933 for 68.8 per cent of the total value of all goods and construction.

Similarly there is no evidence of disequilibrium in the production of durable and non-durable goods during the post-war period. From 1914 to 1921 the proportion of durable goods in the total output fluctuated between 36.6 per cent and 35.8 per cent. From 1923 to 1929 the value of output of durable goods did not fall below 41.8 per cent of the total and did not rise above 42.6 per cent of the total. Durable goods declined to 36.3 per cent of the total in 1931 and to 30.7 per cent in 1933.

Durable goods may be classified into consumers' and producers' goods. Consumers' durable goods include residential construction, while non-residential construction is included in producers' durable goods. This classification shows that the increase in the share of durable goods in the total output from 1914 to 1923 was due primarily to the increase in the value of output of consumers' durable goods. The value of the output of this group of goods was 12.6 per cent of the total in 1914; 15.6 per cent in 1923; and 14.2 per cent in 1929. The proportion of the total represented by these goods declined to 11 per cent in 1931 and 10.1 per cent in 1933.

The proportion of producers' durable goods was 18.6 per cent of the total in 1914; 21.5 per cent in 1923; and 23.2 per cent in 1929. In 1931 the proportion declined to 17.4 per cent and in 1933 to 14.4 per cent.

Had production of all goods and construction continued at the 1929 rate during the five-year period, 1930-1934, there would have been produced $133.1 billion more goods and construction than the actual output during these years. This total unrealized output consists of $69.2 billion of durable goods and $63.9 billion of non-durable goods. Construction is included among durable goods. The backlog of construction accumulated during the last five years is about two and a half times its 1929 value of $13.1 billion.

Fabricated Structural Steel

Awards Slightly Higher—New Projects in Fair Volume

LETTINGS of 9300 tons, although slightly in excess of those reported a week ago, again are in small tonnages. The largest booking, calling for only 975 tons, is for a school at Bayonne, N. J. New projects of 16,300 tons compare with 8500 tons in the previous week and 60,000 tons two weeks ago. Among new sizable jobs are 3500 tons for a post office at San Antonio, Tex., 3200 tons for book shelves and ornamental iron work for the Library of Congress, Washington, and 2500 tons for a parcel post building at Detroit. Plate awards call for 2800 tons. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Cambridge, Mass., 190 tons, dog track grandstand, to New England Structural Co.

Roselle, N. J., 125 tons, St. Joseph Church, to H. R. Goeller.

New York, 260 tons, school No. 2 in Jackson Heights, to Lehigh Structural Steel Co.

Westport, N. Y., 335 tons, State highway bridge, to McClintic-Marshall Corpn.

Wellsville, N. Y., 165 tons, David A. Howe Library, to R. S. McManus Steel Construction Co.

Rensselaer, N. Y., 280 tons, addition to building No. 83, General Aniline Works, to James McKinney & Co.

Bayonne, N. J., 975 tons, high school, to Bethlehem Fabricators, Inc.

Hackensack, N. J., 210 tons, International Printing Ink Co., to Harris Structural Steel Co.

Washington, 120 tons, book stacks, to Berger Mfg. Co.

SOUTH AND SOUTHWEST

Charleston, W. Va., 225 tons, building for West Virginia Chlorine Products Co., to Pittsburgh Bridge & Iron Works.

Wise County, Va., 185 tons, State bridge, to Virginia Bridge & Iron Co.

Foard and Hardeman Counties, Tex., 220 tons, bridge, to North Texas Iron & Steel Co.

Jefferson County, Okla., 395 tons, bridge, to Capitol Steel & Iron Co.

Beaver County, Okla., 184 tons, bridge, to Capitol Steel & Iron Co.

Abilene, Tex., 320 tons, post office and court house, to J. B. Klein Iron & Foundry Co.

State of Oklahoma, 565 tons, highway bridges, to J. B. Klein Iron & Foundry Co.

CENTRAL STATES

Nickel Plate Railroad, 240 tons, bridges at Muncie and Cicero, Ind., to Fort Pitt Bridge Co.

Dearborn, Mich., 655 tons, courtesy building for Ford Motor Co., to R. C. Mahon Co.

Minneapolis, Minn., 750 tons, armory, to Minneapolis-Moline Power Implement Co.

Crossville, Ill., 125 tons, railroad bridge, to Duffin Iron Co.

Dekalb, Ill., 300 tons, industrial building, to Mississippi Valley Structural Steel Co.

Chicago, 570 tons, warehouse for Wander Co., to an unnamed fabricator.

Chicago, 105 tons, International Harvester Co., to Gage Structural Steel Co.

State of Missouri, 220 tons, highway bridge, to American Bridge Co.

State of Kansas, 400 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Morton County, Kan., 215 tons, project 27-2-NRH 358-A, to Benn Sibbitt, Wichita, Kan.

WESTERN STATES

Laramie, Wyo., 275 tons, fine arts building at State University, to Minneapolis-Moline Power Implement Co.

Monolith, Cal., 255 tons, extension for Monolith Portland Cement Co., to McClintic-Marshall Corpn.

Los Angeles, 1070 tons, tunnel ribs for Metropolitan Water District, Specification M-2038, reawarded to Youngstown Steel Car Corpn.

Long Beach, Cal., 200 tons, Franklin junior high school, to Consolidated Steel Corpn.

Snohomish County, Wash., 227 tons, State bridge over Ebey Slough, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Northampton, Mass., 250 tons, school unit.

Auburn, Mass., 125 tons, high school.

Providence, R. I., 400 tons, senior high school.

New York, 310 tons, State highway bridge at Kingsbridge station.

Lancaster, Pa., 160 tons, metal cap building addition for Armstrong Cork Co.

Olcott, N. Y., 200 tons, Niagara County bridge; bids taken March 5.

Washington, 3200 tons, book shelves and ornamental iron work for Library of Congress.

THE SOUTH

State of Georgia, 1100 tons, highway bridges.

Gainsville, Ga., 200 tons, bridge.

Atlanta, Ga., 200 tons, housing project.

McCrea, Ga., 600 tons, bridge.

Waco, Tex., 190 tons, post office.

San Antonio, Tex., 3500 tons, post office.

CENTRAL STATES

Detroit, 2500 tons, parcel post building.

Chicago, 2500 tons, superstructure for Ashland Avenue bridge; bids to be taken March 14.

Minneapolis-St. Paul Sanitary District, 2000 tons; Barnett & Record, St. Paul, general contractors.

Hawkins Store, Mo., 100 tons, State highway bridge.

St. Louis, 200 tons, high school.

WESTERN STATES

San Francisco, 425 tons, subway.

Bonneville, Ore., 385 tons, emergency ship lock.

Almira, Wash., 250 tons, gantry crane and hoist, Specification 664-D; Lakeside Bridge & Steel Co. low bidder.

FABRICATED PLATE

AWARDS

Muskegon, Mich., 600 tons, tanks, to Chicago Bridge & Iron Works.

Nashville, Tenn., 175 tons, tanks for Gulf Refining Co., to Graver Corpn.

Belle, W. Va., two 500,000 and two 250,000 tanks, to Hammond Iron Works.

Elizabethport, N. J., 120 tons, tar separator tank, to McClintic-Marshall Corpn.

Minneapolis, 310 tons, steel hull for pontoon, to Treadwell Construction Co.

Seattle, 100 tons, tank for Seattle Gas Co., to Seattle Boiler Works.

Everett, Wash., 1000 tons, lumber mill, to Willamette Iron & Steel Co.

San Mateo, Cal., 400 tons, school alterations, to Minneapolis-Moline Power Implement Co.

Deming, N. M., 100 tons, tank, to Pittsburgh-Des Moines Steel Co.

NEW PROJECTS

Northboro, Mass., 100 tons, standpipe.

Los Angeles, 106 tons black steel pipe, material for Metropolitan Water District, bids under advisement.

SHEET PILING

Huron, Ohio, 350 to 600 tons, Wheeling & Lake Erie Railroad dock; bids taken.

Cleveland, 130 tons, Pennsylvania Railroad dock.

Buffalo Output Drops to 37 Per Cent

BUFFALO, March 5.—The Lackawanna plant of Bethlehem Steel Corpn. has reduced the number of its active open-hearths from eight last week to seven this week. Republic Steel Corpn. continues to operate five, and Wickwire Spencer Corpn., two. Seneca sheet division of Bethlehem remains on a 75 per cent basis.

A Buffalo concern is reported to have the contract for fabricating 150 tons for a library at Wellsville, N. Y., and a State highway bridge in Niagara County will require 200 tons of steel. Bids are due to be opened this week for this job.

Current railroad scrap lists are understood to contain heavy quantities of material, amounting in all to 4000 or 5000 tons. A large mill in the district is reported to have purchased 3400 tons at $11, and possibly some small tonnages at less than this price. This company is also understood to have bought about 10,000 tons of unassorted scrap outside of Buffalo in the past ten days, at a price which figured more than $11, Buffalo. Another mill purchased a very small lot of specially selected No. 1 heavy melting steel at $11.75.

Pig iron sales show little variation from recent weeks.

Belgian Trade Agreement Menaces The American Steel Worker

THE Belgian - American trade agreement, signed Feb. 27, will result in reductions of $1 to $3 a net net in the import duties on the commoner forms of finished steel, structural shapes excepted. The lowering of these rates is hailed by our State Department as a boon to both urban and rural construction, because it will make it "less costly to enter upon new building and repair operations."

The implication that present steel prices are too high is made explicit in the following comments:

"Domestic prices of these products have been much more rigid than the general average of domestic prices and also more rigid than prices of similar foreign products. In most cases the prices of steel mill products have declined less than those of other building materials and consequently have contributed to the prolonged depression of the construction industries. The reductions in duty . . . should introduce greater flexibility in the prices of these products."

"Rigid" Wages Not Mentioned

So-called "rigidity" of prices is unavoidable under the New Deal. Sharp advances in wage rates, willingly made by the iron and steel industry at the prompting of the Administration, cannot be supported except on a stable foundation of prices. Many steel makers will agree that lower prices would be desirable, but can see no way of reducing them without cutting wage costs. The two ideas—lower tariffs and lower prices—are incompatible so long as wages remain "rigid." The commendable effort, under the NRA, to lift the buying power of the wage earner could not have been attempted without protection from the low prices and low wages of competing industrial nations. The danger of such competition was specifically recognized in Section 3-e of the National Industrial Recovery Act which empowers the President to embargo imports when they endanger wage and price levels in this country. Fortunately the depreciation of the dollar made it unnecessary for the President to invoke that power. Now, however, after an interval of 20 months, one bureau of the executive branch of the Government undertakes to undo what another bureau has built up. It is a case of the left hand being oblivious to what the right hand is doing. Or is it actually believed that we can reconcile low prices with high wages?

Labor Rates Far Above European Levels

The common labor rate in the steel industry in the Pittsburgh, Youngstown, Cleveland and Chicago districts is now 47c. an hour. The average hourly wage for all employees in December, 1934 (the last month for which complete figures are available), was 72.9c. In June, 1933, before the code went into effect the average wage was 53c.

The highest rate for common labor in any European steel-making country does not exceed 30c. an hour, and the average wage of all employees is assumed to be lower than the corresponding American average in like proportion. Postwar improvements in plant and equipment abroad have removed much of the former superiority in American technique. By and large the present differences between American and European costs may be measured by the disparity in wage rates.

Foreign Prices Below Direct American Labor Costs

This European advantage cannot be laughed off. It is a stark reality. Cotton ties of foreign manufacture are now being shipped to our southern ports at delivered prices which are lower than costs at the American mill, without the addition of any freight.

To put it another way, European export prices of various finished steel products at Channel ports are little, if any, higher, and in some cases are lower, than direct labor costs at American mills, without charges for raw materials, taxes, interest, depreciation and other legitimate expenses.

Take merchant steel bars as an example. The price at Continental ports, as reported in THE IRON AGE this week, is $20.23 a metric ton, or $20.55 a gross ton. The number of man-hours required to produce a gross ton of steel bars in this country averages about 35. At 72.9c. an hour, the December average for all American employees, the American cost is $25.52. At 63c. an hour which was the August average for employees receiving hourly, piece work or tonnage rates, the direct American labor cost is $22.05 a gross ton.

The Voice of the Steel Worker Will Be Heard

The moral of this tale is that if American mills are to compete with their foreign competitors without adequate protection they must scrap their investment. Are we ready for a resumption of drastic deflation? Are the equities of investors to be sacrificed on the altar of reciprocity? Strong language, but justified. The new duty on steel bars is $5 a ton, or less than the excess of American labor costs over Channel port prices.

Agriculture wants lower steel prices. Steel workers want lower food costs. But has the steel workman protested because the prices of food products have risen? No. He is glad that the farmer is getting a break. All he asks is similar treatment. And his voice is likely to be heard, even if the interests of the investor are entirely overlookd.

What Imports Mean in Terms of Man-Hours

It is charged that steel imports have been small in relation to total domestic production. Yet there would be no point in granting Belgium concessions unless that country expected to benefit through heavier exports to the United States. As a matter of fact its shipments of certain products to our shores have increased without benefit of tariff cuts and in spite of the depression. In 1929, Belgium's exports of steel bars to the United States totaled 12,750 net tons; in 1933 they were 18,400 net tons. In 1929, its exports of sheet iron and steel saw plates were 6500 tons; in 1933, 7500 tons. Its 1929 exports of hoops and bands to this country were 11,400 tons; its 1933 total was 13,280 tons.

How many fold these totals will increase under the lower duties

(CONCLUDED ON PAGE 64)

Monthly Report of Metal Working Activity

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	January, 1935	December, 1934	January, 1934	1935 to Date	Year 1934
Raw Materials:					
Lake ore consumption (gross tons) [a]	**2,269,525**	1,505,751	1,656,303	2,269,525	22,113,951
Coke production (net tons) [b]	2,889,552	2,501,441	2,583,685	2,889,552	31,830,210
Pig Iron:					
Pig iron output—monthly (gross tons) [c]	1,477,336	1,027,622	1,215,226	1,477,336	15,911,188
Pig iron output—daily (gross tons) [c]	47,656	33,149	39,201	47,656	43,592
Castings:					
Malleable castings—production (net tons) [d]	**43,400**	32,746	30,417	43,400	369,458
Malleable castings—orders (net tons) [d]	**44,568**	36,505	32,501	44,568	354,146
Steel castings—production (net tons) [d]	.....	23,916	27,644	.....	450,087
Steel castings—orders (net tons) [d]	.....	27,312	26,296	.....	434,131
Steel Ingots:					
Steel ingot production—monthly (gross tons) [e]	2,834,170	1,941,595	1,971,187	2,834,170	25,263,569
Steel ingot production—daily (gross tons) [e]	104,969	77,664	73,007	104,969	81,233
Steel ingot production—per cent of capacity [e]	47.67	35.27	33.16	47.67	36.89
Employment in Steel Industry:					
Total employees [e]	**407,071**	386,345	393,013	407,071	409,348
Total payrolls [e]	**$44,328,552**	$35,362,732	$34,877,542	$44,328,552	$457,842,517
Average hours worked per week [e]	**33.6**	27.4	29.2	33.6	30.5
Finished Steel:					
Trackwork shipments (net tons) [e]	**2,333**	2,272	2,811	2,333	49,110
Sheet steel sales—(net tons) [f]	321,831	193,130	209,463	321,831	1,830,682
Sheet steel production (net tons) [f]	235,714	159,740	163,622	235,714	1,895,460
Fabricated shape orders (net tons) [g]	*55,857	67,799	91,594	*55,857	1,054,382
Fabricated shape shipments (net tons) [g]	*85,950	88,687	57,623	*85,950	1,116,222
Fabricated plate orders (net tons) [d]	**18,778**	26,025	15,897	18,778	241,992
Reinforcing bar awards (net tons) [e]	15,600	7,650	17,800	15,600	177,350
U. S. Steel Corpn. shipments (tons) [h]	534,055	418,630	331,777	534,055	5,925,873
Fabricated Products:					
Automobile production U. S. and Canada [d]	**303,372**	185,919	163,811	303,372	2,895,629
Construction contracts (37 Eastern States) [i]	$99,773,900	$92,684,900	$186,463,700	$99,773,900	$1,543,102,300
Steel barrel shipments (number) [d]	.....	424,233	206,347	.....	6,682,400
Steel furniture shipments [d]	.....	**$1,090,171**	**$996,838**	.....	$11,807,843
Steel boiler orders (sq. ft.) [d]	.....	**259,875**	**235,776**	.....	4,368,563
Locomotive orders (number) [k]	0	0	0	0	183
Freight car orders (number) [k]	24	360	150	24	24,611
Machine tool index [l]	65.5	66.1	53.7	65.5	46.2
Foreign Trade:					
Imports of pig iron (gross tons) [m]	.....	3,642	11,886	.....	115,470
Imports of rolled steel (gross tons) [m]	.....	6,274	7,183	.....	100,562
Exports of all steel (gross tons) [m]	.....	85,013	89,798	.....	997,210
Exports, finished steel (gross tons) [m]	.....	78,137	78,818	.....	833,559
Exports of scrap (gross tons) [m]	**186,112**	196,361	87,272	186,112	1,835,554
British Production:					
British pig iron production (gross tons) [n]	521,200	513,500	441,300	521,200	5,978,500
British steel ingot production (gross tons) [n]	757,800	654,500	711,000	757,800	8,860,700

[e] Preliminary.

Sources of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] F. W. Dodge Corpn.; [k] *Railway Age;* [l] National Machine Tool Builders Association; [m] Department of Commerce; [n] British Iron and Steel Federation.

Weekly Indications of Steel Activity

From THE IRON AGE

	Mar. 5, 1935	Feb. 26, 1935	Feb. 5, 1935	March 6, 1934	Average, Year to Date 1935	Average, Year to Date 1934
Steel ingot operations—Per cent of capacity	**48.5**	48.5	56.5	49.0	50.3	38.2

	Week Ended Mar. 5, 1935	Week Ended Feb. 26, 1935	Week Ended Feb. 5, 1935	Week Ended March 6, 1934	Year to Date 1935	Year to Date 1934
Fabricated structural steel awards	**9,300**	6,700	16,600	21,800	111,365	144,615
Fabricated plate awards	**2,800**	1,460	1,390	6,750	18,035	13,665
Sheet steel piling awards	**0**	0	0	0	2,400	13,065
Reinforcing bar awards	**1,575**	5,000	3,850	6,725	39,440	42,150

Steel Production Holds at 48½ Per Cent of Capacity

Demand, Though Less Buoyant, Remains in Substantial Volume—Rail Business Appears—Pipe Line Placed—Scrap Tone Better

THE decline in steel production that set in during the second week of February has been arrested and the national average remains unchanged at 48½ per cent of capacity. Gains at Chicago and in the Philadelphia district are offset by recessions in the Valleys, at Buffalo and at Detroit. Operations for the country to date this year average 50.3 per cent as compared with 38.2 per cent in the corresponding period in 1934.

The behavior of scrap prices is also more encouraging, with the downward trend halted in some markets and retarded in others. However, a drop of 50c. a ton on heavy melting steel at Philadelphia has reduced THE IRON AGE scrap composite from $11.67 to $11.50 a gross ton.

THE opening of mill books for second quarter business has failed to stimulate forward buying except in flat-rolled steel. Most full-finished sheet mills have enough tonnage entered to keep them running at capacity through March and some are now well committed into April. Strip mills are comfortably booked for the remainder of this month. Production of full-finished sheets this week is believed to be at the highest level since last spring. Output for the entire sheet industry consequently is slightly higher, at 70 to 75 per cent of capacity. Strip mill operations are holding at 65 per cent, while tin plate production has been lifted from 70 per cent to a range of 70 to 75 per cent.

Despite this favorable showing in the lighter rolled products, steel demand as a whole has lost momentum. Though the automotive industry continues to take large shipments, it is no longer crowding the mills for delivery. Forecasts of automobile output have not been scaled down, but motor car makers now have more than adequate stocks of material and parts to draw upon and do not care to expand their inventories further. Chrysler's assemblies last month of 80,277 units were the largest for any February in its history. Ford turned out 135,663 units in February, and is aiming at 160,000 for March, 170,000 for April and 156,000 for May. Chevrolet will produce 80,000 to 90,000 units this month, with a substantial increase in prospect for April, but is reputed to have parts built ahead for close to 100,000 cars.

A GRADUAL accumulation of railroad orders and a seasonal expansion of outdoor work are counted on to make up for any loss in tonnage that the mills may suffer next quarter because of stocking by the motor car industry. Support is also expected from the farm machinery and tractor industry, which is steadily pushing its operations to higher levels, and from manufacturers of household equipment, whose needs continue to grow.

The Atlantic Coast Line has bought 5000 tons of rails, and the Virginian 2200 tons, while the Gulf, Mobile & Northern has closed for 3218 tons of rails and 700 tons of track accessories. The Northern Pacific has ordered 1860 tons of tie plates. The New York Central is expected to close this week on 20,000 tons of rails and 9500 tons of fastenings. The Kansas City Southern is inquiring for 2000 tons of rails and the Missouri Pacific system will buy 10,000 tons. The Erie's rail requirements are estimated at 20,000 tons. The Chicago & North Western has applied for Government funds to finance repairs to 115 locomotives and 2000 automobile cars.

The General Petroleum Corpn., Los Angeles, has divided an order for 8100 tons of 10¾-in. seamless steel pipe among three producers. Bids taken in San Francisco for the trans-bay crossing of the Hetch-Hetchy pipe line call for 5500 tons of cast iron pipe and 1300 tons of plates.

Structural steel awards of 9300 tons compare with 9655 tons in the previous week. New projects total 16,300 tons as against 8500 tons last week and 60,000 tons two weeks ago.

Reductions in duties of $1 to $3 a ton on some of the commoner forms of finished steel, under the Belgian trade agreement, threaten to open the way to more serious inroads by foreign steel into coast markets.

PIG IRON production in February was 1,608,552 tons, or 57,448 tons daily, as against 1,477,336 tons, or 47,656 tons per day, in January. The gain in daily rate was 20½ per cent. There were 96 furnaces in blast March 1 compared with 90 on Feb. 1, a net gain of 6.

Steel production this week is up one point to 55 per cent at Chicago and one point to 36 per cent in the Philadelphia district. Operations are off five points to 50 per cent in the Valleys, three points to 38 per cent at Buffalo, and five points to 95 per cent at Detroit.

Bolts and nuts have been advanced by reducing discounts to 70, 10 and 5 per cent off list, as compared with 70, 10 and 10 per cent. Fluorspar has been reduced $3 to $13 a ton, mines, for all-rail shipment and $1.50 to $16 a ton for barge delivery.

THE IRON AGE composites for pig iron and finished steel are unchanged at $17.90 a ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:

	Mar. 5, 1935	Feb. 26, 1935	Feb. 5, 1935	Mar. 6, 1934
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$19.26
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	18.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa	19.76	19.76	19.76	18.76
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	19.76
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago	24.04	24.04	24.04	23.54
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:

Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh.	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.75
Bars, Chicago	1.85	1.85	1.85	1.80
Bars, Cleveland	1.85	1.85	1.85	1.80
Bars, New York	2.13	2.13	2.13	2.08
Plates, Pittsburgh	1.80	1.80	1.80	1.70
Plates, Chicago	1.85	1.85	1.85	1.75
Plates, New York	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.70
Structural shapes, Chicago	1.85	1.85	1.85	1.75
Structural shapes, New York	2.05¼	2.05¼	2.05¼	1.95¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh.	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.40

Finished Steel

Per Lb.:	Mar. 5, 1935 Cents	Feb. 26, 1935 Cents	Feb. 5, 1935 Cents	Mar. 6, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.75
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.85
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.40
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.25
Barbed wire, galv., P'gh	3.00	3.00	3.00	2.85
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	2.90
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$12.75	$12.75	$13.25	$14.75
Heavy melting steel, Phila	*11.00*	11.50	11.75	12.00
Heavy melting steel, Ch'go	10.75	10.75	11.50	12.00
Carwheels, Chicago	*11.00*	12.00	12.00	12.25
Carwheels, Philadelphia	12.50	12.50	12.50	12.75
No. 1 cast, Pittsburgh	13.25	13.25	13.75	13.75
No. 1 cast, Philadelphia	11.00	11.00	11.00	12.50
No. 1 cast, Ch'go (net ton)	*9.50*	10.00	10.00	9.50
No. 1 RR. wrot., Phila	11.00	11.00	11.25	11.00
No. 1 RR. wrot., Ch'go (net)	8.75	8.75	10.00	9.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$3.50
Foundry coke, prompt	4.60	4.60	4.60	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	7.75
Lake copper, New York‡	9.12½	9.12½	9.12½	8.00
Tin (Straits), New York	*47.37½*	47.87½	51.15	52.62½
Zinc, East St. Louis	**3.90**	3.75	3.70	4.40
Zinc, New York	**4.25**	4.10	4.05	4.75
Lead, St. Louis	3.40	3.40	3.35	3.90
Lead, New York	3.55	3.55	3.50	4.00
Antimony (Asiatic), N. Y.	14.50	14.50	14.50	7.30

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
March 5, 1935	2.124c. a Lb.	$17.90 a Gross Ton	$11.50 a Gross Ton
One week ago	2.124c.	17.90	11.67
One month ago	2.124c.	17.90	12.17
One year ago	2.008c.	16.90	12.92
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1934	2.199c., April 24	2.008c., Jan. 2	$17.90, May 1	$16.90, Jan. 27	$13.00, Mar. 13	$9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.946c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Operations Holds at 37 Per Cent

Valley Rate Is Off Three Points to 50 Per Cent but Wheeling District Average Holds at 80 Per Cent—Sheet and Tin Mills Run at High Rate

PITTSBURGH, March 5.—Demand for finished steel for delivery this month is tapering, and producers have not yet had an opportunity to gage the trend of consumer needs for second quarter. A few orders representing largely automotive business have been entered for early April delivery and in one of two instances for late April shipment, but thus far consumers have not rushed to get a place on production schedules for the coming quarter.

Pressure upon sheet and strip mills in the Pittsburgh district for March shipments to motor car centers has not relaxed noticeably, and production of full-finished sheets this week is perhaps at the highest point since last spring. Output for the entire sheet industry this week consequently is slightly higher at 70 to 75 per cent. Strip production is unusually steady at about 65 per cent. Tin plate mills have accelerated schedules this week for an average production of about 70 to 75 per cent.

Other steel departments are not faring so well. Structural mills are faced with rapidly declining backlogs, while wire and tube mill operations are far behind the general average of flat rolled steel production. The local rail mill probably will complete rolling against the Norfolk & Western rail order about the middle of March.

In the Pittsburgh district raw steel output this week is unchanged at 37 per cent. Operations in the Valleys and nearby northern Ohio mills are down three points to 50 per cent. Activity in the Wheeling district is held at 80 per cent. At the current rate of raw steel production steel makers in the Pittsburgh district are not stocking ingots so heavily as they were in February, when operations were about 40 per cent.

Bolt and nut prices have been advanced five points for spot and second quarter delivery.

Pig Iron

The volume of new business since March 1 has been below expectations. The announcement of second quarter prices on that date failed to affect the general consuming trade, which is still restricting its orders to prompt delivery. Extremely limited interest is being displayed in second quarter needs, and only generally low stocks in consumers' hands are sustaining fair prospects for moderate buying this month.

Semi-Finished Steel

With non-integrated mill backlogs of sheet and strip orders diminishing with the close of the quarter, the demand for slabs, billets and sheet bars has lessened. Detached mill demand for forging stock, skelp and other semi-finished grades is on a reduced scale, and interest in these items for second quarter has not assumed significant proportions.

Bolts, Nuts and Rivets

Bolt and nut prices have been advanced five points for spot and second quarter business. Machine and carriage bolts and hot pressed and semi-finished hexagon nuts are now quotable at 70, 10 and 5 per cent off list. Specifications against first quarter contracts are slightly heavier and probably will continue to increase in anticipation of the advanced contract prices to become effective on April 1. Railroads are taking a fairly steady, though small, volume of shipments. Ship work at present is a limited consuming field. Takings by the automotive industry have become less frequent.

Reinforcing Steel

About 2000 tons of steel reinforcement will be purchased by the Government for the Sutherland irrigation project at Paxton, Neb. Other fresh specifications emanate chiefly from Government sources, with a fairly steady crop of small post offices appearing from month to month. Private capital apparently has not come out of hiding, and private construction consequently continues to languish. Road work, excepting in the South and Southwest, still is hampered by winter conditions, but soon will bring some much needed tonnage to mills when spring programs are launched.

Cold-Finished Bars

Orders for spot shipment are tapering, and second quarter coverages thus far have been disappointing. March, which usually is the peak month for the jobbing trade, has thus far been bare of important warehouse replenishments. Demand from agricultural implement makers and business machines is steady. Automotive buyers are believed to be well covered for the time being, but further heavy buying from that quarter is considered inevitable if motor car makers adhere to their heavy assembly schedules.

Bars

The volume of bookings has been further reduced by a continued letup in specifications from the automotive industry. The decline in general demand is not so severe, but enough to act as another brake on mill schedules. The movement of merchant bars to the cold-finishing trade likewise is slower. Stocks of bars at motor car centers are believed to be in process of rapid liquidation, and replenishments are expected before the close of first quarter. Buying for the second quarter has not yet gotten under way.

Plates and Shapes

Contracts for a substantial tonnage of plates pending for new barge bottoms are slow in materializing. Recent fresh specifications have been in limited volume. The Louisville & Nashville Railroad is inquiring for 2300 tons of steel, including a large proportion of plates for repair work. The structural market in this district is far from lively. The only important new inquiry reported in the past week covered 1100 tons for highway bridges in Georgia. Local fabricating shops are not able to check a general decline in backlog tonnage, as orders reaching this district have not added much to order books.

Wire

Automotive specifications have narrowed. A relatively small volume of bolt and spoke wire business is reported. Spring wire has benefited moderately by increased specifications from bed makers who are engaged on Government orders for Army cots for CCC camps. Demand from the farm regions still is disappointing, and merchant items are moving rather slowly. Practically all business in this market is for prompt shipment. Little or no interest is reported in second quarter coverage.

Tubular Products

General demand is a shade heavier. Interest in oil country goods is the only bright spot in this market. Other items, including seamless boiler tubes and mechanical tubing, are holding their own but are not offering strong support to current mill schedules. Warehouse replenishments are not particularly encouraging, and are not expected to reach important proportions in the face of unchanged discount cards on pipe for second quarter delivery.

Sheets

Although new specifications are limited, pressure for deliveries to the automotive industry has necessitated the stepping up of operations in some instances. In the current week sheet mill production of 70 to 75 per cent will slightly exceed that of the preceding period. The leading producer is engaged at around 80 per cent, with some smaller units continuing at virtual capacity. Thus far in March, no great rush is noticeable in consuming quarters to place orders for the second quarter. With automobile production still pointed to a high rate for second quarter, sheet producers are rather sanguine of renewed demand before the close of March.

Tin Plate

Specifications still are being placed in heavy volume, and average production for the tin plate industry this week will rise slightly to between 70 and 75 per cent. Can makers are reported to be building up stocks of tin plate in various packing centers in anticipation of early crops. Tin plate producers are stocking little, if any, of current output.

Strip Steel

Some specifications are reported for early April delivery. Orders for shipment later next month have not yet appeared freely, and apparently there is no great rush on the part of the consuming trade to specify far ahead. In the meantime, a goodly number of strip units continue to be fully engaged, with no let-down in sight until the end of March. Producers are relying heavily upon an expected resumption of automotive buying to offset any sharp recessions in strip demand in April. Spot orders from miscellaneous consumers are holding their own.

Coke and Coal

The domestic coke market has become depressed as a result of a spell of mild weather. There is no definite trend in the consumption of foundry or furnace grades, which are quotably unchanged for March delivery. By contrast the bituminous coal market is active. Restricted navigation has opened on the Great Lakes, but it is believed that most loadings at lake ports will await more generally favorable weather conditions before the season definitely gets under way. Activity at upper lake ports is at a minimum. More rigid policing of the bituminous industry is in prospect as a result of a recent proclamation that promises more rigid observation of the code provision requiring submission of copies of orders and invoices on all contracts and sales on and after March 15.

Scrap

Scrap prices appear to be resisting further weakness for the time being. In the absence of any large mill purchases of No. 1 steel in the past seven days that grade remains unchanged at $12.50 to $13. Pronounced softness continues in machine shop turnings, which are lower at $7.75 to $8.25. Heavy industrial production has flooded the market with compressed sheet steel, but significant sales at below $12.75 are lacking. Tenders were received yesterday by the Baltimore & Ohio Railroad on about 8800 tons of scrap. No. 1 heavy melting steel on that list is reported to have been sold to a dealer at about $12.90, delivered Pittsburgh district. A more definite gage of the entire scrap market will probably be provided by the opening of bids tomorrow on the current Pennsylvania Railroad list, which covers about 20,400 tons, including 6700 tons of No. 1 heavy melting steel.

Further Increase in Rail Backlog of Ensley Mill

BIRMINGHAM, March 5.—Birmingham pig iron producers look for marked improvement in pig iron consumption in the second quarter. Books were opened March 1, without change in prices. The base price is $14.50.

Nine blast furnaces are now active, an increase of one. Last week Republic Steel fired No. 2 stack, its second active furnace. This furnace has undergone extensive repairs in the past three months.

Since the first of February, when there were only four active stacks, furnace operations in the Birmingham district have increased more than 100 per cent, and the same is true of open-hearth operations. This is largely due to rail orders and the resumption of the Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. On Feb. 1, six open-hearth furnaces were operating. The month closed with 13 active, and the same number will be operated this week.

Gulf, Mobile & Northern has bought 3218 tons of rails and 700 tons of rail accessories. There has been a pickup in demand for small structural shapes. A fair volume of sheets and wire products business continues. Books on finished steel were opened for second quarter, with all prices reaffirmed.

Cast iron pipe manufacturers report a lag in their business. Scheduled PWA lettings are not so frequent as in the last quarter.

Further Sag in Boston Scrap Prices

BOSTON, March 5.—There has been a further easing in prices for No. 1 heavy melting steel, No. 2 steel, bundled skeleton and steel turnings for Pittsburgh district delivery, but comparatively little business has been transacted at the new quotations. The export market has come to life again and dealers are paying full prices for No. 1 and No. 2 steel, old rails, automobile parts and similar scrap. A boat is loading 4000 tons here for Italy, another boat has been chartered to load a similar tonnage for England, and Providence, R. I., interests have chartered a boat to load around April 1. Japanese and Argentine interests are in Rhode Island buying textile machinery, thereby reducing possible machinery cast scrap supplies.

Blast furnace representatives are trying to round up second quarter delivery orders, but current pig iron buying is confined to odds and ends, mostly high silicon and high manganese, with the weekly turnover just a few hundred tons. Rice, Barton & Fales, Worcester, Mass., have not covered on their 700-ton inquiry.

Scrap Prices Hold At Detroit

DETROIT, March 5.—The downward trend of scrap prices was brought to a halt the past week, and local dealers feel that perhaps the bottom has been reached. There is little hope, however, that the market will become much firmer so long as the automobile industry continues to turn out such large quantities of old material.

Ingot Output Rises to 55 Per Cent at Chicago

Gradual Accumulation of Rail Orders Supports Operations—Structural Inquiries, at 18,000 Tons, Are Largest in Many Weeks

CHICAGO, March 5.—Ingot output has risen almost one and one-half points to 55 per cent of capacity. This is the first time that the production curve has turned upward since the first week in February. Whether or not the curve will continue to climb in March cannot be told with certainty at this time but there are some factors that indicate demand will increase. Although there is nothing of importance in the railroad market, it seems quite probable that some rail tonnage will soon develop. Furthermore, mills have been hesitant to roll rail orders as soon as received and they therefore have accumulated some tonnage that must soon be made ready for shipment.

Structural inquiries, at 18,000 tons, are the best in many weeks, and most fabricators look for early spring releases on numerous projects that have been dormant during the winter months. Pressure against some sheet products is unabated and orders are coming in from a more diversified field. Irrespective of the trend in other parts of the country, the demand for tin plate in this district is active and shipments are growing. Releases by automobile manufacturers are again climbing, though the change is slight. Farm implement manufacturers are reaching new highs in production schedules and it is reported that there is actually a shortage of tractors, which are moving rapidly into most farm areas.

Pig Iron

Although forward contracting has made some headway, it is clear that buyers are not easily shaken out of habits that have been formed in the past few years. More users are anticipating requirements by taking tonnages ahead of original plans, and some users are now in the market after having been out for six months or more. The melt is unchanged in most directions but is gaining in agricultural implement foundries.

Rails

Activity in this market is all beneath the surface where discussion of tonnages to be used in the late spring is getting more attention. Nothing of startling size is in sight, but mills feel that small tonnages are definitely developing. The accessory market is very much in the same condition. There are a few scattered inquiries, such as that of the Pere Marquette for 200 tons of tie plates, but the prospects are that demand will grow somewhat in the near future. More interest is being shown in light rails for use at various mining properties.

Wire Products

Second quarter commitments have not as yet started to flow in real volume. The opening days of March find sales only slightly better than in the preceding month, and shipments are holding close to a dead level. Moderate improvement is noted in the miscellaneous manufacturing trade, while on the other hand movement to automobile centers is lighter. It is too early to gage the effects of recent dust storms in the Western Prairie States beyond the fact that jobbers in that area are very cautious. The jobbing trade is opening up very slowly in the near South.

Sheets

A very slight improvement is noted in deliveries promised on some grades of sheet mill products. However, on the whole, the picture is little changed from a week ago with the exception that second quarter contracting is getting away to a good start. Orders are being entered freely by locker and shelving manufacturers.

Cold Rolled Strip

Output remains at 60 to 65 per cent of capacity, which is not far from full rating when consideration is given to the character of specifications. The use of this commodity is spreading among the smaller users.

Plates

Demand is somewhat improved but most projects are small. An order from Michigan calls for 600 tons for tanks. The proposed gas line from the Panhandle of Texas to Detroit is now meeting with strong opposition from all factions in the coal industry. The trade is gaining the impression that the Burlington car building program is none too certain of coming to a head.

Structural Material

This market is improved from the viewpoint of inquiries, which reach the comparatively high total of about 18,000 tons of Government and State work. Awards, though heavier, remain light. The total is about 3000 tons, in which are included only two small private jobs.

Bars

This commodity is once more moving faster to automobile centers, and farm implement manufacturers are also reaching above the production levels which they have been holding in recent weeks. Most small users in this district are fairly busy and mills report that it is a daily occurrence to have old customers, long out of the market, return for odd and end lots.

Cast Iron Pipe

Orders total about 1600 tons, but inquiries are scarce. All sellers are closely watching Washington with the hope that lending for public works will be extended. Evanston, Ill., has ordered 900 tons and Colchester, Ill., has placed a tonnage. Private work is limited.

Reinforcing Bars

Although awards are light, there is a far better tone to the private construction side of the market. New projects in Chicago include the Diesel-electric locomotive plant for General Motors, a new department store, a 500-ton addition to a rug plant and a sizable addition to a candy kitchen. Current awards are all small and are confined to a few post offices and various contractors' needs for road contracts.

Scrap

The lower prices that now prevail are effectively checking the flow of scrap and once again brokers are pressing dealers for deliveries in order that quotas at mills can be filled. That is the stronger side of the market. On the other side is a tendency for prices on many specialties to sink to lower levels. Industrial scrap, though being produced in fair quantities, is not being put up for sale and railroads are still withdrawing offerings unless prices attract them. Relaying rails, 60 lb. and heavier, are quotable in the range of $18 to $20 a net ton.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel — *Base per Lb.*

F.o.b. Pittsburgh .....1.80c.
F.o.b. Chicago .....1.85c.
F.o.b. Gary .....1.85c.
F.o.b. Duluth .....1.95c.
Del'd Detroit .....1.95c.
F.o.b. Cleveland .....1.85c.
F.o.b. Buffalo .....1.90c.
Del'd Philadelphia .....2.09c.
Del'd New York .....2.13c.
F.o.b. Birmingham .....1.95c.
F.o.b. cars dock Gulf ports.....2.20c.
F.o.b. cars dock Pacific ports.....2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh .....1.70c.
F.o.b. Chicago .....1.75c.
F.o.b. Gary .....1.75c.
F.o.b. Moline, Ill. .....1.75c.
F.o.b. Cleveland .....1.75c.
F.o.b. Buffalo .....1.80c.
F.o.b. Birmingham .....1.85c.
F.o.b. cars dock Gulf ports.....2.10c.
F.o.b. cars dock Pacific ports.....2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh .....2.05c.
F.o.b. Chicago .....2.10c.
F.o.b. Gary .....2.10c.
Del'd Detroit .....2.20c.
F.o.b. Cleveland .....2.10c.
F.o.b. Youngstown .....2.10c.
F.o.b. Buffalo .....2.10c.
F.o.b. Birmingham .....2.10c.
F.o.b. cars dock Gulf ports.....2.45c.
F.o.b. cars dock Pacific ports.....2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh .....1.90c.
F.o.b. Chicago .....1.95c.
F.o.b. Gary .....1.95c.
F.o.b. Cleveland .....1.95c.
F.o.b. Youngstown .....1.95c.
F.o.b. Buffalo .....1.95c.
F.o.b. Birmingham .....1.95c.
F.o.b. cars dock Gulf ports.....2.30c.
F.o.b. cars dock Pacific ports.....2.30c.

Iron

F.o.b. Chicago .....1.80c.
F.o.b. Terre Haute, Ind. .....1.75c.
F.o.b. Louisville, Ky. .....2.10c.
F.o.b. Danville, Pa. .....1.80c.
F.o.b. Berwick, Pa. .....1.70c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh .....2.10c.
F.o.b. Chicago .....2.15c.
F.o.b. Gary .....2.15c.
F.o.b. Cleveland .....2.15c.
F.o.b. Buffalo .....2.20c.
Del'd Detroit .....2.30c.
Del'd eastern Michigan .....2.35c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton

F.o.b. Pittsburgh $50.00
F.o.b. Chicago 50.00
F.o.b. Duluth 51.00
F.o.b. Cleveland 50.00
F.o.b. Birmingham 53.00
F.o.b. Houston, Orange, Beaumont, Galveston 59.00
F.o.b. Mobile 58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi 59.00
F.o.b. cars dock Pacific ports.....63.00

Plates

Base per Lb.

F.o.b. Pittsburgh .....1.80c.
F.o.b. Chicago .....1.85c.
F.o.b. Gary .....1.85c.
Del'd Cleveland .....1.985c.
F.o.b. Coatesville .....1.90c.
F.o.b. Sparrows Point .....1.90c.
Del'd Philadelphia .....1.985c.
Del'd New York .....2.08c.
F.o.b. Birmingham .....1.95c.
F.o.b. cars dock Gulf ports.....2.20c.
F.o.b. cars dock Pacific ports.....2.35c.
Wrought iron plates, f.o.b. P'gh.....3.20c.

Floor Plates

F.o.b. Pittsburgh .....3.35c.
F.o.b. Chicago .....3.40c.
F.o.b. Coatesville .....3.45c.
F.o.b. cars dock Gulf ports.....3.75c.
F.o.b. cars dock Pacific ports.....3.90c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh .....1.80c.
F.o.b. Chicago .....1.85c.
Del'd Cleveland .....1.985c.
F.o.b. Buffalo .....1.90c.
F.o.b. Bethlehem .....1.90c.
Del'd Philadelphia .....2.005c.
Del'd New York .....2.0525c.
F.o.b. Birmingham (standard) .....1.95c.
F.o.b. cars dock Gulf ports.....2.20c.
F.o.b. cars dock Pacific ports.....2.35c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh .....2.15c.
F.o.b. Chicago .....2.25c.
F.o.b. Buffalo .....2.25c.
F.o.b. cars dock Gulf ports .....2.60c.
F.o.b. cars dock Pacific ports.....2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh .....1.85c.
No. 10, f.o.b. Gary .....1.95c.
No. 10, del'd Detroit .....2.05c.
No. 10, del'd Phila. .....2.14c.
No. 10, f.o.b. Birmingham .....2.00c.
No. 10, f.o.b. dock cars Pacific ports .....2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh .....2.40c.
No. 24, f.o.b. Gary .....2.50c.
No. 24, del'd Detroit .....2.60c.
No. 24, del'd Phila. .....2.69c.
No. 24, f.o.b. Birmingham .....2.55c.
No. 24, f.o.b. dock cars Pacific ports .....3.05c.
No. 24, wrought iron, Pittsburgh...4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh .....2.50c.
No. 10 gage, f.o.b. Gary .....2.60c.
No. 10 gage, del'd Detroit .....2.70c.
No. 10 gage, del'd Phila. .....2.79c.
No. 10 gage, f.o.b. Birmingham ...2.65c.
No. 10 gage, f.o.b. dock cars Pacific ports .....3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh.....2.95c.
No. 20 gage, f.o.b. Gary .....3.05c.
No. 20 gage, del'd Detroit .....3.15c.
No. 20 gage, del'd Phila. .....3.24c.
No. 20 gage, f.o.b. Birmingham....3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports .....3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh .....3.10c.
No. 24, f.o.b. Gary .....3.20c.
No. 24, del'd Phila. .....3.39c.
No. 24, f.o.b. Birmingham .....3.25c.
No. 24 f.o.b. dock cars Pacific ports .....3.70c.
No. 24, wrought iron, Pittsburgh...4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh .....3.40c.
F.o.b. cars dock Pacific ports.....4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh .....3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh .....2.75c.
No. 28, Gary .....2.85c.
No. 28, cars dock, Pacific Coast ports .....3.35c.

Tin Plate *Per Base Box*

Standard cokes, f.o.b. P'gh district mill $5.25
Standard cokes, f.o.b. Gary..... 5.35
Standard cokes, f.o.b. cars dock Pacific ports 5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.....$10.00
15-lb. coating I.C..... 12.00
20-lb. coating I.C..... 13.00
25-lb. coating I.C..... 14.00
30-lb. coating I.C..... 15.25
40-lb. coating I.C..... 17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

Base per Lb.

All widths up to 24 in., P'gh.....1.85c.
All widths up to 24 in., Chicago....1.95c.
All widths up to 24 in., del'd Detroit .....2.05c.
All widths up to 24 in., Birmingham 2.00c.
Cooperage stock, Pittsburgh .....2.10c.
Cooperage stock, Chicago .....2.20c.

Cold-Rolled Strips

Base per Lb.

F.o.b. Pittsburgh .....2.60c.
F.o.b. Cleveland .....2.60c.
Del'd Chicago .....2.88c.
F.o.b. Worcester .....2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland....2.90c.
No. 14, Worcester .....3.30c.
No. 20, Pittsburgh or Cleveland....3.30c.
No. 20, Worcester .....3.70c.

Hot-Rolled Rail Steel Strips

Base per Lb.

F.o.b. Pittsburgh .....1.70c.
F.o.b. Chicago .....1.75c.
F.o.b. Birmingham .....1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade — *Per Lb.*

Bright wire .....2.30c.
Spring wire .....2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

Base per Keg

Standard wire nails $2.60
Smooth coated nails 2.60
Galvanized nails:
15 gage and coarser 4.60
16 gage and finer 5.10

Base per 100 Lb.

Annealed fence wire.....$2.45
Galvanized fence wire 2.80
Polished staples 3.30
Galvanized staples 3.55
Barbed wire, galvanized 3.00
Woven wire fence, base column.....63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

Off List

F.o.b. Pittsburgh .....35 and 2½ off
F.o.b. Chicago .....35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel		Wrought Iron	
Inches	Black / Galv.	Inches	Black / Galv.
⅛	51½ / 29½	⅛	+9½ / +13
¼ to ⅜	53½ / 32	¼ & ⅜	+1½ / +21½
½	58½ / 47	½	31½ / 15
¾	62 / 52	¾	36½ / 20½
1 to 3	64 / 55	1 & 1¼	39½ / 25½
		1½	43½ / 28
		2	41½ / 26

Lap Weld

2	60 / 51	2	37 / 22½
2½ to 3	63 / 54	2½ to 3½	38 / 25
3½ to 6	65 / 56	4 to 8	40 / 28½
7 and 8	64 / 54	9 to 12	38 / 24½
9 and 10	63½ / 53½		
11 and 12	62½ / 52½		

Butt Weld, extra strong, plain ends

⅛	48½ / 33½	⅛	+13 / +45½
¼ to ⅜	51 / 38	¼ & ⅜	+2½ / +34½
½	56½ / 47½	½	32½ / 17½
¾	61 / 52	¾	37½ / 22½
1 to 3	63 / 55	1 to 2	43½ / 29

Lap Weld, extra strong, plain ends

2	58 / 50	2	40 / 26
2½ to 3	62 / 54	2½ to 4	45½ / 33
3½ to 6	65½ / 57½	4½ to 6	45 / 33½
7 and 8	64½ / 54½	7 & 8	46 / 33
9 and 10	63½ / 53½	9 to 12	41½ / 30
11 and 12	62½ / 52½		

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Cold Drawn	Hot Rolled
1 in. o.d.	13	B.W.G.	$ 8.60	$7.35
1¼ in. o.d.	13	B.W.G.	10.19	8.70
1½ in. o.d.	13	B.W.G.	11.26	10.20
1¾ in. o.d.	13	B.W.G.	12.81	11.60
2 in. o.d.	13	B.W.G.	14.35	13.00
2¼ in. o.d.	13	B.W.G.	16.00	14.50
2½ in. o.d.	12	B.W.G.	19.29	17.50
2¾ in. o.d.	12	B.W.G.	20.45	18.50
3 in. o.d.	12	B.W.G.	21.45	19.50
4½ in. o.d.	10	B.W.G.	41.08	37.50
3½ in. o.d.	11	B.W.G.	27.09	24.60
4 in. o.d.	10	B.W.G.	33.60	30.50
4½ in. o.d.	10	B.W.G.	41.08	37.50
5 in. o.d.	9	B.W.G.	51.56	46.75
6 in. o.d.	7	B.W.G.	79.15	71.90

Extras for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
10,000 lb. or ft. to 24,999 lb. or ft. 15%
2,000 lb. or ft. to 9,999 lb. or ft. 25 %
Under 2,000 lb. or ft. .....40 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

1½ in o.d.	13	B.W.G.	$ 8.75
1¾ in. o.d.	13	B.W.G.	11.00
2 in. o.d.	13	B.W.G.	13.20
2¼ in. o.d.	13	B.W.G.	15.75
2½ in. o.d.	12	B.W.G.	18.00
2¾ in. o.d.	12	B.W.G.	20.25
3 in. o.d.	12	B.W.G.	22.50
3¼ in. o.d.	11	B.W.G.	25.00
3½ in. o.d.	11	B.W.G.	27.50
4 in. o.d.	10	B.W.G.	30.00
4½ in. o.d.	10	B.W.G.	35.50
5 in. o.d.	9	B.W.G.	44.50
6 in. o.d.	7	B.W.G.	60.50

Quantity Extras:
40,000 lb. or ft. .....base
25,000 lb. or ft. to 39,999 lb. or ft. .....plus 5%
10,000 lb. or ft. to 24,999 lb. or ft. .....plus 15%
2,000 lb. or ft. to 9,999 lb. or ft. .....plus 25 %
Under 2,000 lb. or ft.....plus 40 %

CHARCOAL IRON BOILER TUBES

Base Discounts, f.o.b. Pittsburgh

In. O. D.	
1½ and 1¾	44
2 —2¼	13 and 3
2½—2¾	16 and 3
3	17 and 3
3¼—3½	18 and 3
4	20 and 3
4½, 5, 6	21 and 3

Extras for quantity: For 1½ to 1¾ up 8 points under 10,000 lb., up 4 points 10,000 lb. to carload. For 2 in. to 3½ in., up 2 points without supplementary 5 per cent, under 10,000 lb.; supplementary 5 per cent instead of supplementary 3 per cent for 10,000 lb. to carload.

In sizes 2 in. to 4½ in. O.D. Included all tubes more than four gages heavier than standard are priced per lb. as follows: Carload and over, 9c.; extra for quantity—under 10,000 lb. 1c. per lb. 10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago....$47.00
*4-in., del'd Chicago 54.00
6-in. and larger, del'd New York.. 49.00
4-in. del'd New York 59.00
*6-in. and larger, Birmingham..... 43.00
*4-in. Birmingham 43.00

Class "A" and gas pipe, $3 extra.
*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger $38, Birmingham, and $46, delivered Chicago, and 4-in pipe $41, Birmingham, and $49 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton $36.00
Angle bars, per 100 lb.....1.90

F.o.b. Code Basing Points

Light rails (from billets) per gross ton $35.00
Light rails (from rail steel) per gross ton 34.00

Base per 100 Lb.

Spikes, 9/16 in. and larger 3.00
Spikes, ½ in. and smaller 3.10
Spikes, boat and barge 3.10
Tie plates, steel 1.90
Tie plates, Pacific Coast ports 1.90
Track bolts, to steam railroads 3.50
Track bolts, no jobbers, all sizes (per 100 count) .....70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 5
Hot-pressed nuts, blank or tapped, square	70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S. all sizes	70, 10 and 5
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter	70, 10 and 5
½ in. to 1 in. diameter	70, 10 and 5
larger than 1 in. diameter	70, 10 and 5
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, P'gh.	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 5

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.a.b. Pittsburgh or Cleveland	$2.90
F.a.b. Chicago	3.00
F.a.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.a.b. Pittsburgh	70 and 5
F.a.b. Cleveland	70 and 5
F.a.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ⅜ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85
Upset set screws, cut and oval point	75 and 10 to 80
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.a.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.a.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.a.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers		Alloy Differential per 100 lb.
2000	(⅜% Nickel)	$0.25
2100	(1¼% Nickel)	0.55
2200	(3½% Nickel)	1.50
2300	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4400	Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100	Chromium Spring Steel	base
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.70
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for carry for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.a.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

Cr to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)
(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20½c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn				
From East. Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia				
From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati				
From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio				
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio				
From Hamilton, Ohio	20.50	20.50	....	....
Mansfield, Ohio				
From Cleveland and Toledo	20.26	20.26	....	....
Indianapolis				
From Hamilton, Ohio	20.77	20.77	....	....
South Bend, Ind.				
From Chicago	20.55	20.55	....	....
Milwaukee				
From Chicago	19.50	19.50	....	....
St. Paul				
From Duluth	20.94	....	....	....
Davenport, Iowa				
From Chicago	20.26	20.26	....	....
Kansas City				
From Granite City	21.04	21.04	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. $23.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.04
Delivered Buffalo	24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained V	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti. 6 to 8% C, f.o.b. furnace carload and contract per net ton.	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	106.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	11.50 to 12.00
No. 2 railroad wrought	12.50 to 13.00
Scrap rails	13.50 to 14.00
Rails 3 ft. and under	14.50 to 15.00
Compressed sheet steel	12.25 to 12.75
Hand bundled sheet steel	11.50 to 12.00
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	7.75 to 8.25
Short shov. turnings	7.75 to 8.25
Short mixed borings and turnings	6.75 to 7.25
Cast iron borings	6.75 to 7.25
Cast iron carwheels	12.75 to 13.25
Heavy breakable cast	12.00 to 12.50
No. 1 cast	13.00 to 13.50
Railr. knuckles and couplers	14.25 to 14.75
Rail. coil and leaf springs	14.25 to 14.75
Rolled steel wheels	14.25 to 14.75
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	15.00 to 15.50
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.00 to 14.50
Steel car axles	15.00 to 15.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$10.50 to $11.00
Automobile hvy. melt. steel	10.00 to 10.50
Shoveling steel	10.50 to 11.00
Hydraulic comp. sheets	9.50 to 10.00
Drop forge flashings	9.25 to 9.75
No. 1 busheling	9.00 to 9.50
Rolled carwheels	11.50 to 12.00
Railroad tires	12.00 to 12.50
Railroad leaf springs	11.50 to 12.00
Axle turnings	9.50 to 10.00
Steel couplers and knuckles	11.50 to 12.00
Coil springs	12.00 to 12.50
Axle turnings (elec. fur.)	10.50 to 11.00
Low phos. punchings	12.00 to 12.50
Low phos. plates, 12 in. and under	13.50 to 14.00
Cast iron borings	6.25 to 6.75
Short shoveling turnings	6.25 to 6.75
Machine shop turnings	5.50 to 6.00
Rerolling rails	12.00 to 12.50
Steel rails, less than 3 ft.	13.00 to 13.50
Steel rails, less than 2 ft.	13.50 to 14.00
Angle bars, steel	11.50 to 12.00
Cast iron carwheels	11.00 to 11.50
Railroad malleable	13.25 to 13.75
Agricultural malleable	9.50 to 10.00

	Per Net Ton
Iron car axles	$14.50 to $15.00
Steel car axles	13.75 to 14.25
No. 1 railroad wrought	8.75 to 9.25
No. 2 railroad wrought	9.25 to 9.75
No. 2 busheling	5.00 to 5.50
Locomotive tires, smooth	10.00 to 10.50
Pipe and flues	5.00 to 5.50
No. 1 machinery cast	9.50 to 10.00
Clean automobile cast	9.00 to 9.50
No. 1 railroad cast	8.50 to 9.00
No. 1 agricultural cast	8.50 to 9.00
Stove plate	6.00 to 6.50
Grate bars	6.00 to 6.50
Brake shoes	6.50 to 7.00

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.00
No. 2 heavy melting steel	9.50
No. 1 railroad wrought	10.75 to 11.25
Bundled sheets	9.50 to 10.00
Hydraulic compressed, new	10.50 to 11.00
Hydraulic compressed, old	7.50 to 8.00
Machine shop turnings	6.00 to 6.50
Heavy axle turnings	8.50 to 9.00
Cast borings	5.00 to 5.50
Stove plate (steel works)	8.50 to 9.00
Heavy breakable cast	10.50 to 11.00
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.00 to 8.50
Shafting	17.00 to 17.50
Steel axles	16.50 to 17.00
No. 1 forge fire	9.50 to 10.00
Cast iron carwheels	12.25 to 12.75
No. 1 cast	11.00
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$8.25 to $8.75
Scrap rails for melting	8.25 to 8.75
Loose sheet clippings	4.75 to 5.25
Bundled sheets	6.25 to 6.75
Cast iron borings	4.75 to 5.25
Machine shop turnings	4.75 to 5.25
No. 1 busheling	6.25 to 6.75
No. 2 busheling	3.00 to 3.50
Rails for rolling	9.25 to 9.75
No. 1 locomotive tires	7.50 to 8.00
Short rails	11.75 to 12.25
Cast iron carwheels	8.25 to 8.75
No. 1 machinery cast	9.50 to 10.00
No. 1 railroad cast	8.75 to 9.25
Burnt cast	6.25 to 6.75
Stove plate	6.25 to 6.75
Agricultural malleable	8.25 to 8.75
Railroad malleable	9.25 to 9.75

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$10.50 to $11.00
No. 2 heavy melting steel	10.00 to 10.50
Compressed sheet steel	9.50 to 10.00
Light bundled sheet stampings	7.50 to 8.00
Drop forge flashings	9.50 to 10.00
Machine shop turnings	7.25 to 7.75
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
Steel axle turnings	9.50 to 10.00
Low phos. billet crops	14.50 to 15.00
Cast iron borings	7.50 to 8.00
Mixed borings and short turnings	7.50 to 8.00
No. 2 busheling	7.50 to 8.00
No. 1 cast	12.00 to 12.50
Railroad grate bars	7.00 to 7.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	14.50 to 15.00
Rails for rolling	15.50 to 18.00
Railroad malleable	13.00 to 13.50
Cast iron carwheels	12.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$11.00
No. 2 heavy melting scrap	$9.50 to 10.00
Scrap rails	12.00 to 12.50
New hydraul. comp. sheets	9.50 to 10.00
Old hydraul. comp. sheets	8.50 to 9.00
Drop forge flashings	9.50 to 10.00
No. 1 busheling	9.50 to 10.00
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	5.50 to 6.00
Knuckles and couplers	12.00 to 12.50
Coil and leaf springs	12.00 to 12.50
Rolled steel wheels	12.00 to 12.50
Low phos. billet crops	13.75 to 14.25
Short shov. steel turnings	6.50 to 7.00
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
No. 2 busheling	6.50 to 7.00
Steel car axles	13.50 to 14.00
Iron axles	13.50 to 14.00
No. 1 machinery cast	11.00 to 11.50
No. 1 cupola cast	10.00 to 10.50
Stove plate	9.50 to 10.00
Steel rails, 3 ft. and under	14.00 to 14.50
Cast iron carwheels	11.00 to 11.50
Industrial malleable	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Chemical borings	8.50 to 9.00

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	6.75 to 7.00
Scrap T rails	7.75 to 8.00
*No. 2 steel	8.25 to 8.50
No. 2 steel	5.75 to 6.25
Breakable cast	5.75 to 6.00
Machine shop turnings	2.00 to 2.25
Bundled skeleton, long	5.25 to 5.50
Forge flashings	5.25 to 5.50
Mixed borings and turnings	1.00 to 1.50
Shafting	12.00 to 12.50
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
Stove plate	4.00 to 4.25

Per gross ton delivered consumers' yards:

Textile cast	$9.00 to $9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$8.00 to †$9.00
No. 2 heavy melting steel	*7.00 to †7.50
Heavy breakable cast	6.50 to 7.00
No. 1 machinery cast	7.50 to 8.00
No. 2 cast	6.50 to 7.00
Stove plate	6.00 to 6.50
Steel car axles	12.50 to 13.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	9.00 to 9.50
Short shoveling turnings	2.50 to 3.00
Machine shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.00 to $9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$8.75 to $9.25
No. 1 heavy melting	8.50 to 9.00
No. 2 heavy melting	7.50 to 8.00
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	10.00 to 10.50
Railroad springs	11.00 to 11.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	4.00 to 4.50
Rails for rolling	10.75 to 11.25
Machine shop turnings	4.00 to 4.50
Heavy turnings	5.50 to 6.00
Steel car axles	13.50 to 14.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	7.50 to 8.00
Steel rails less than 3 ft.	11.75 to 12.25
Steel angle bars	9.50 to 10.00
Cast iron carwheels	8.00 to 8.50
No. 1 machinery cast	9.00 to 9.50
Railroad malleable	10.00 to 10.50
No. 1 railroad cast	9.00 to 9.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$7.50 to $8.00
Borings and short turnings	4.25 to 4.75
Long turnings	$3.50 to $4.00
No. 1 machinery cast	10.25 to 10.75
Automotive cast	10.75 to 11.25
Hydraul. comp. sheets	7.50 to 8.00
Stove plate	6.50 to 7.00
New factory busheling	6.50 to 7.00
Old No. 2 busheling	4.25 to 4.75
Sheet clippings	5.50 to 6.00
Flashings	7.25 to 7.75
Low phos. plate scrap	8.25 to 8.75

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.00
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic scheelite, delivered†	17.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	$13.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	16.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville, Prompt	$3.85
Foundry, f.o.b. Connellsville, Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	[illegible]
Foundry, Birmingham	[illegible]
Foundry, by-product, St. Louis, f.o.b. ovens	[illegible]
Foundry, by-product, del'd St. Louis	[illegible]

Coal

	Per Net To
Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.0
Mine run coking coal, f.o.b. W. Pa.	2.05 to 2.2
Gas coal, ¾-in., f.o.b. Pa. mines	2.25 to 2.5
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.3
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.6
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.1

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	[illegible]
No. 4 industrial	[illegible]

	Per Gal. f.o.b. Baltimore
No. 3 distillate	[illegible]
No. 4 industrial	[illegible]

	Per Gal. del'd Chicago
No. 3 industrial fuel oil	[illegible]
No. 5 industrial fuel oil	[illegible]

	Per Gal. f.o.b. Cleveland
No. 3 distillate	[illegible]
No. 4 industrial	[illegible]
No. 5 industrial	[illegible]

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. W High-heat Duty Brick	Intermed Duty Bri
Pennsylvania	$45.00	[illegible]
Maryland	45.00	[illegible]
New Jersey	55.00	[illegible]
Ohio	45.00	[illegible]
Kentucky	45.00	[illegible]
Missouri	45.00	[illegible]
Illinois	45.00	[illegible]
Ground fire clay, per ton	7.00	

Chrome Brick

	Per Net To
Standard size	$[illegible]

Chemically Bonded Chrome Brick

	Per Net To
Standard size, f.o.b. Baltimore, Plymouth Meeting and Chester	[illegible]

Silica Brick

	Per 1000 f.o.b. W
Pennsylvania	[illegible]
Chicago	[illegible]
Birmingham	[illegible]
Silica clay, per ton	[illegible]

Magnesite Brick

	Per Net To
Standard size, burned, f.o.b. Baltimore and Chester, Pa.	[illegible]
Unburned, f.o.b. Baltimore	[illegible]
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	[illegible]
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	[illegible]
Domestic, f.o.b. Chewelah, Wash.	[illegible]

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 counts, 65 per cent off list.	
Carriage bolts, 100 count, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head cap screws	80
Cut point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05
Cement c't'd nails, base per keg	3.05

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.22c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.75c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-rolled; strip, soft and quarter hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'l'd sheets (No. 24*)	3.85c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
Per Cent Off List	
Machine bolts, cut thread: All diameters	70
Carriage bolts, cut thread: All diameters	70
Boiler tubes: Per 100 Ft.	
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stocks	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
1000 lb. or over	70 and 10
200 to 999 lb.	67½ and 10
100 to 199 lb.	65 and 10
Less than 100 lb.	60 and 10

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.10c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	3.00c.
Hot-rolled annealed sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.
†Outside delivery 10c. less.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.75c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.91
Com. wire nails, base per keg:	
1 to 24 kegs	3.50
25 to 50 kegs	3.30
Large quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.16
4-in.	42.32

BUFFALO

Base per Lb.

Plates	3.37c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb.	3.55

BOSTON

Per Lb. Base

Beams, channels, angles, tees, zees	3.52c.
H beams and shapes	3.52c.
Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.53c.
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.60c. to 4.60c
Half rounds, half ovals, ovals and bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds, squares and hexagons	4.00c.
Cold-rolled strip steel	3.245c.
Cold-finished flats	3.85c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24 ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.61c
Cold-rolled strip	3.30c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.
Per Cent Off List	
Machine bolts	70
Carriage bolts	70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.70c.	3.55c.
Shapes, standard	3.55c.	3.70c.	3.55c.
Soft steel bars	3.60c.	3.70c.	3.60c.
Reinforcing bars	3.50c.	3.50c.	3.50c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.45c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.80c.	3.75c.
Galv. sheets (No. 24)	5.00c.	5.05c.	5.00c.
Cold finished steel:			
Rounds	5.95c.	5.95c.	4.75c.
Squares and hexagons	7.20c.	7.20c.	6.00c.
Flats	7.70c.	7.70c.	7.00c.
Common wire nails —base per keg	$3.40	$3.25	$3.30
less carload			

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

Base per Lb.

High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Reinforcing Steel

Awards 1575 Tons—New Projects 6600 Tons

AWARDS

Dennis-Yarmouth, Mass., 270 tons, State bridge, to Bethlehem Steel Co.

St. Louis, 482 tons, addition to Phillips Hospital, to Joseph T. Ryerson & Son.

Denver, 143 tons, two bridges over Cherry Creek, to George Phillips.

State of Colorado, 117 tons, highway work in three counties, to unnamed bidders.

Glendale, Cal., 100 tons, material for city, to an unnamed bidder.

Snohomish County, Wash., 346 tons, State bridge over Ebey Slough, to an unnamed bidder.

State of Washington, 100 tons, highway work in two counties, to Pacific Coast Steel Corpn.

NEW REINFORCING BAR PROJECTS

Providence, R. I., 600 tons, Mount Pleasant Avenue school.

Boston, 440 tons, parcel post building.

Chicago, 238 tons, Brach Candy Co.

Chicago, 500 tons, addition to Olson Rug Co. plant.

Chicago, 150 tons, Goldblatt department store.

Dover, Ohio, 100 tons, relocation of Pennsylvania Railroad tracks in connection with Muskingum Conservancy District project.

Minneapolis St. Paul Sanitary District, 1600 tons; Barnett & Record, general contractors.

Detroit, 1000 tons, parcel post building.

San Jose, Cal., 132 tons, Guadalupe dam and spillway; bids March 13.

State of California, 140 tons, highway work in eight counties; bids March 21.

Los Angeles, 1700 tons, White Point outfall sewer; bids within 90 days.

Zinc Prices Advanced $3 a Ton—Tin Quotations Decline Only Moderately

Sterling Fluctuations Influence Tin Prices More Than London Uncertainty—Copper Sales Well Sustained—Demand for Lead Well Sustained

NEW YORK, March 5.—Demand for copper is well sustained in the new month, sales in the first two full working days having totaled nearly 4500 tons. Buying today indicates that a 2000-ton daily average may easily be maintained. February sales of approximately 29,450 tons practically reached the industry's "book" under the code and sellers are almost certain that March business will exceed it. The price here is unchanged at 9c. a lb., Connecticut Valley, and quotations at London have strengthened in sympathy with the weakness in sterling exchange. The market there this morning was 6.70c. a lb., usual Continental base ports. Negotiations for world production curtailment have given the market a much more buoyant tone, and producers are rather optimistic regarding the outcome of the conversations on the subject.

Tin

While the sharp decline in the London market has been temporarily checked, prices here have been influenced by sterling fluctuations and are still somewhat unsteady. The situation abroad is devoid of activity as both buyers and sellers await Parliament debates on pool manipulation which are scheduled to begin on Thursday. Quotations in London this morning on spot and future standard were £218 10s. and £213 12s. 6d. respectively, while spot Straits metal was available at £221. The Singapore market was steady at £221 7s. 6d. At New York Straits tin was quotable at 47.37½c. a lb., and little buying was in evidence. Consumers show no disposition to make forward commitments until the situation at London is cleared up.

Lead

The lead market is without special feature, although buying is well maintained. Some sellers are having no difficulty disposing of their quotas in the early morning trading and often have sufficient inquiry to account for their intakes for two days in advance. Corroders are active buyers, as also are makers of paint, batteries and foil. The price situation is unchanged with the majority of sellers quoting 3.55c. a lb., New York, and 3.40c., St. Louis. The St. Joseph Lead Co., however, continues to take business in the East at 3.60c., New York.

Zinc

The spelter market has been rising steadily over the past 10 days and has achieved a net advance of $4 a ton. Quotations advanced $1 on each of the last two days of February, and a further easing up yesterday and today has apparently established 4.25c. a lb., New York, and 3.90c., East St. Louis, as the prevailing market. Some metal was available yesterday at five points less, but seems to have disappeared from the picture this morning. Buying was rather heavy as the market went up, sales last week having amounted to about 7000 tons, against 4000 tons in the previous comparable period. However, the market on concentrates was unchanged on Saturday, having still been quotable at $25 a ton for flotation and $26 for mill grades. Production declined to 8150 tons, compared with sales of 4550 tons and shipments of about 7400 tons.

Ingot Brass and Bronze

The Non-Ferrous Ingot Metal Institute reports that, in the 28-day period ending Feb. 22, the average prices paid for commercial 80-10-10 and commercial 85-5-5-5 brass ingots were 9.786c. a lb. and 8.271c. a lb. respectively. In the preceding comparable period the corresponding figures were 9.787c. and 8.263c. a lb. respectively.

Non-Ferrous Averages

The average prices of the major non-ferrous metals for January, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.*‡	8.75c. a lb.
Lake copper, Eastern delivery*	9.12c. a lb.
Straits tin, Spot, N. Y.	49.99c. a lb.
Zinc, East St. Louis	3.71c. a lb.
Zinc, New York	4.06c. a lb.
Lead, St. Louis	3.53c. a lb.
Lead, New York	3.68c. a lb.

*Blue Eagle copper. ‡Price ¼c. higher in Connecticut Valley.

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 27	Feb. 28	Mar. 1	Mar. 2	Mar. 4	Mar. 5
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, New York	47.62½	47.35	47.75		47.37½	47.37½
Zinc, East St. Louis	3.80	3.85	3.85	3.85	3.87½	3.90
Zinc, New York	4.15	4.20	4.20	4.20	4.22½	4.25
Lead, St. Louis	3.40	3.40	3.40	3.40	3.40	3.40
Lead, New York	3.55	3.55	3.55	3.55	3.55	3.55

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 14.50c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	49.75c. to 50.75c.
Tin, bar	51.75c. to 52.75c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.25c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum, virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	51.00c.
Tin, bar	53.00c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slabs	5.50c. to 5.75c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	56.00c.
Solder, ½ and ½	31.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.37½c.	6.12½c.
Copper, hvy. and wire	5.25c.	5.75c.
Copper, light and bottoms	4.25c.	4.75c.
Brass, heavy	2.75c.	3.37½c.
Brass, light	2.00c.	2.75c.
Hvy. machine composition	4.37½c.	4.87½c.
No. 1 yel. brass turnings	3.62½c.	4.12½c.
No. 1 red brass or compos. turnings	3.87½c.	4.37½c.
Lead, heavy	2.62½c.	3.00c.
Zinc	1.87½c.	2.25c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

British Pig Iron Demand Is Less Active—Sterling Drop Aids Steel

LONDON, ENGLAND, March 4 (*By Cable*).—Pig iron is dull with no indications of spring expansion yet evident. Specifications have been reduced and fresh business is limited to prompt parcels. Substantial price cuts have been made on export business. Exports to Italy have been suspended because of Italian import restrictions. Hematite is livelier, but forward business is lacking.

Steel works are busy, but production is exceeding bookings. British semi-finished steel makers are benefiting from uncertainty in tariff revision, as no business is being placed abroad. Makers of rails and structural steel are active, but plate and sheet mills are insufficiently employed. Steel scrap is in good demand, but prices are unsatisfactory.

Tin plate domestic buying is steady but export demand is only moderate. Sterling depreciation is expected to bring improvement.

The Continental iron and steel markets are slightly more active but still unsatisfactory. The break-up of the Continental Tube Cartel has accentuated the uncertainty regarding the future of the International Raw Steel Cartel, and spring bookings have been postponed pending the forthcoming Cannes meetings. Sterling depreciation is causing anxiety.

Germany has increased export prices to certain destinations in view of diminishing her quota excesses which have already been reduced from 50,000 to 10,000 tons.

Illinois Corrugated Culvert Co., Peoria, Ill., has been organized to fabricate and sell Toncan iron corrugated metal pipe, sectional plate pipe and arches in Illinois. Construction of a modern culvert fabricating plant is under way at Peoria, but pending its completion, shipments are being made from Danville, Ill., where the new company is operating the plant formerly owned by the Canton Culvert Co., division of Republic Steel Corpn.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 19s.
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To June 1; 18s. 5d. to 19s. 3d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4
Plate, 3/16 in. and 5 mm.	£4 2s. 6d.
Sheets, ¼ in.	£4 7s. 6d.
Beams, Thomas.	£3 2s. 6d.
Angles (Basic).	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

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TUNGSTEN ELECTRIC CORPORATION
BISSETT STEEL DIVISION

Philadelphia Operations Rise One Point to 36 Per Cent

Prolonged Domestic Disinterest Forces Scrap Prices Down — Bolt and Nut Discounts Lowered to 70-10-5

PHILADELPHIA, March 5.—All district furnace plants with the exception of that of Lukens Steel Co. are melting in unchanged volume. The Coatesville mill has added an additional furnace, thereby elevating the district rate one point to 36 per cent, the level which prevailed two weeks ago. The Pencoyd plant is melting steel in three furnaces and has a small structural mill on for the entire week.

Railroads continue to ignore the steel market, and there is no indication that substantial purchases for repair work will be made in the near future. The local shipyards are practically inactive, and no relief from the current poor demand for structural material is expected until State highway work appears in the spring. For the last month the pressure for deliveries of automobile sheets in the Middle West has served to swing some tonnages of other grades of material to less active mills in this area. However, this pressure has been relieved, and local producers are now moving decreased tonnages to the automobile area.

The discount rate on bolts and nuts has been lowered to 70-10-5 for fresh second quarter business.

Pig Iron

Foundry melt is apparently slightly higher and there has been some expansion in iron sales. Most furnace representatives experienced a better February than January, and aggregate district bookings for the former month amounted to about 9000 tons, compared with approximately 7000 tons sold during the first month of the year. With steel mills melting at only 36 per cent of capacity and foundries pouring on the average of three days a week, total demand for iron is not large. The current poor demand is even further intensified by the comparatively low price of foundry scrap, thereby influencing both foundries and mills to charge lower percentages of pig iron.

Sheets and Strip

Even though second quarter books have been opened local consumers of sheets and strip are showing no marked interest in forward commitments. Several nearby radio makers have purchased strip, and the two autobody stamping plants are each week entering modest orders for wide sheets. Otherwise, there is practically no demand for this material. It is hoped that a lift in light tank work near the end of the month may bring increased demand for blue-annealed sheets. The current movement of this type of steel is not engaging more than 25 per cent of the district's potential output.

Bars, Plates and Shapes

Deliveries of floor plates, treads and similar materials are holding at a fairly substantial level. The plate market, however, continues inactive with the exception of a spotty and light flow of small miscellaneous orders. The Hammond Iron Works has been awarded a contract for 180 tons of plates for four tanks to be built at Belle, W. Va., for the du Pont Company. The only active tonnage consists of about 600 tons of plates and shapes. The structural shape market is also dull. McClintic-Marshall Corpn. will furnish 270 tons for a Mifflin County, Pa., bridge. The only new pending job calls for 140 tons for a hospital alteration at Scranton, Pa. Of the 1200 tons of steel active in this district for large projects, no final disposal is expected for several weeks due to the delays incident to most Federal financed projects.

Imports

The following iron and steel imports were received here last week: 1046 tons of steel pipe from Germany; 524 tons of pig iron from British India; 66 tons of steel tubes, 50 tons of steel forgings, 46 tons of steel wire and 30 tons of steel bars from Sweden, and 48 tons of maganese ore from Cuba.

Scrap

A small amount of specialty scrap is moving into domestic consumption, but there is no district demand for heavy grades with the exception of a few scattered dealer purchases by Bethlehem Steel. No. 1 steel is now available at $11, and other price revisions of a nominal character have been made. No. 2 steel is quoted at $9.50 and new bundles are 50c. lower. Couplers and knuckles have been reduced to $14 to $14.50, and machine shop turnings have been dropped to

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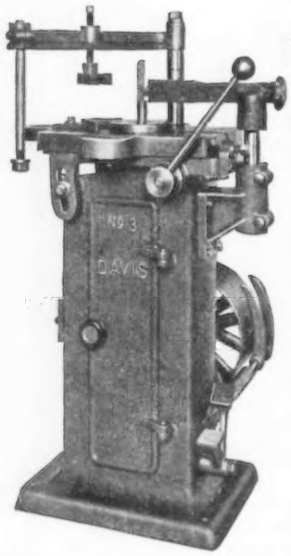

It's a waste of time and results are likely to be unsatisfactory.

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The capital investment is small.

Write for illustrated circulars today describing the older standard machines, also new style tilting table type.

DAVIS KEYSEATER COMPANY
400 Exchange Street ROCHESTER, NEW YORK

$6.25 a ton. The real status of the domestic market will be more discernible after prices are announced on the five railroad lists on which bids will be taken during the week. Bids will also be taken March 7 on the Washington navy yard list. Foreign purchasers are taking advantage of the reaction in the domestic market, and are placing new orders at lower levels. Brokers have been forced to lower their bids, and the Port Richmond offers for No. 1 and No. 2 steels are now at $10 and $9 respectively.

Cast Iron Pipe

Chelsea, Mass., will award a small tonnage of 8-in. class B pipe this week.

Andover, Mass., has plans for water main extensions from Lowell Street to Greenwood Road to cost $25,000.

Harwich, Mass., plans water main system to cost $200,000.

Oakman, Ala., will ask bids in about 60 days for water pipe line system. Fund of $32,000 has been arranged for this and other waterworks construction. Totten & Loving, Guin, Ala., are consulting engineers.

Wellington, Kan., plans about 16,000 ft. of 16-in. for main water line from proposed new waterworks station at New Wellington Lake to city, entire project to cost about $105,000. E. W. Merrifield, superintendent, Board of Public Utilities, is in charge.

Billings, Mont., plans extensions in pipe lines for water supply in vicinity of municipal airport, Eastern Montana Normal and Polytechnic school districts. Cost about $50,000. R. T. Hurdle is city engineer.

Washington, Va., plans water pipe lines. Special election has been called for March 26 to vote bonds.

Yazoo City, Miss., plans water pipe lines. Fund of $126,000 is being arranged for this and other municipal improvements. H. M. Love, mayor, is in charge.

Mandan, N. D., plans about 18 city blocks of new water pipe lines; also 1,000,000-gal. all-steel water reservoir. Fund of $49,000 is being arranged through Federal aid. R. C. Sandberg, Central Trust Building, Rock Island, Ill., is engineer.

Mattoon, Ill., will ask bids early in April for pipe lines for water supply; also for elevated steel tank and tower, wash water tank, water filtration plant and other waterworks equipment. Cost about $100,000. J. A. Foetz is water superintendent.

Colchester, Ill., has awarded 375 tons to James B. Clow & Sons.

Evanston, Ill., has placed 900 tons of 16 and 20-in. with an unnamed bidder.

Columbus, Ohio, has awarded 450 tons to James B. Clow & Sons.

Cabot, Ark., plans water pipe lines. Fund of $41,000 is being arranged for this and other waterworks installation. F. A. Prichett, Wallace Building, Little Rock, Ark., is consulting engineer.

Mount Olive, Iowa, will ask bids early in spring for water pipe lines; also for elevated tank and tower, pumping machinery and other waterworks equipment. Fund of $115,000 has been arranged. Warren & Van Praag, Milliken Building, Decatur, Ill., are consulting engineers.

Blackwell, Okla., let contract to Sherman Machine & Iron Works, Oklahoma City, for 31,700 ft. of 16-in. for main water line.

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Start this motor. Stop that motor. Change the speed of another. Reverse the direction of rotation of still another.

Controlling the Landis Type 30 Roll Grinder amounts to just that. It is all accomplished from the operator's platform. No extra steps. No tugging, pulling or straining. Merely the pushing of a button or the turning of a knob. What could be easier?

Nothing probably except your sending for a copy of catalog No. H-301. It goes into complete detail about ease of control and the numerous other Type 30 Roll Grinder features. 179

LANDIS TOOL CO.
WAYNESBORO, PA.

Los Angeles will take bids within 90 days on White Point outfall sewer in which 5630 ft. of 60-in. is specified.

San Francisco took bids March 6 on 5500 tons for Hetch Hetchy pipe line over San Francisco Bay.

San Francisco will take bids March 13 on about 1035 tons of 8 to 16-in., mostly class H.

Beverly Hills, Cal., has awarded contract which includes 111 tons to be furnished by general Contractor.

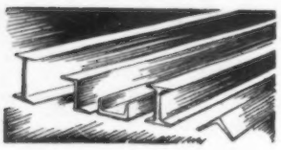
Koosharen, Utah, has let 123 tons to an unnamed bidder.

Monroe, Utah, has placed contract for 268 tons.

Kanab, Utah, has awarded 466 tons to an unnamed bidder.

FOR use on mining machines, reel locomotives and for similar applications, the General Electric Co. is offering a new cable, the finish of which consists of a circular-loom-woven sheath, applied in a manner similar to the weaving of carpet. Under this sheath is a layer of Glyptal cement, the sheath being so applied that it is embedded in the Glyptal cement and partially embedded in the rubber insulation. It is stated that this process produces a cable that is tough and extremely abrasion resisting.

Cleveland Rate Unchanged At 63 Per Cent of Capacity



Pressure From Automotive Industry Eases—Bolts and Nuts Advanced—Fluorspar and Steel Scrap Prices Decline

CLEVELAND, March 5.—A fairly heavy volume of business in sheets for delivery after April 1 has been placed by automobile manufacturers and consumers in other fields. Orders for considerable of this tonnage were sent to mills previous to March 1 and entered on that date. With this exception the opening of books for the second quarter aroused no interest, either in the placing of specific orders or contracts for the quarter.

While the automotive industry continues to take large shipments, there is less pressure for delivery from that source. Some of the larger automotive plants have built up large stocks and do not wish to be caught with unusually heavy inventories should there be a slowing down in production because of labor troubles or other causes. Manufacturers of household equipment are very busy and the demand for sheets from this source is well maintained.

Most sheet mills have enough business on their books to keep them running at capacity through March and some are now committed well into April. Strip mills are comfortably filled for the remainder of March.

With the recent rush to get orders on the books, there is little new demand for either sheets or strip steel for March shipment. Demand for other forms of finished steel has declined moderately.

Ingot output in the Cleveland-Lorain territory is unchanged this week at 63 per cent of capacity. Activity in the construction field is confined mostly to public work. Railroads are buying some steel for repair work. Rail inquiries from roads centering here are not expected before April.

Bolt and nut prices have been advanced five points for the second quarter, this being the only price change for that delivery. The scrap market is weak, with further reductions on steel-making grades.

Pig Iron

New demand has declined. As consumers generally are buying only for early needs, the opening of books for the second quarter has not yet brought out any contracts for that period. Shipments, however, are being maintained at recent rates and no falling off is looked for in March. The automotive industry continues to take substantial quantities. Makers of electrical equipment and of pipe line fittings have increased their orders. Demand from the heating industry has subsided.

Sheets

Substantial tonnages of sheets have been placed by some of the automobile companies since the opening of books March 1 for the second quarter. Although most of the buying was for April, some of the orders were for May delivery. While the demand from the automotive industry continues heavy, some of the automotive plants are showing more caution in making commitments than a few weeks ago. These have accumulated large stocks and do not wish to have excessive inventories should labor troubles interfere with production schedules or should the falling off in car sales necessitate a slowing down.

Considerable business also has been placed by refrigerator, washing machine, stove and metal sign manufacturers. Consumers generally are buying for production schedules rather than contracting for the entire quarter. A number of the mills will be unable to deliver all the cold-rolled sheets they have on order for March shipment and these orders will be canceled and reentered for April delivery.

Strip Steel

New demand has declined. The automotive industry seems to be covered for its March requirements and it is in no hurry to make more extended commitments. Parts making units of one large automotive interest have slowed down production.

Bolts, Nuts and Rivets

A 5 per cent advance to 70, 10 and 5 per cent discount for the second quarter has been announced on bolts and nuts. The advance will also apply to new business for March shipment. Stove bolts are unchanged. A higher advance has been made on corrugated carriage, step, elevator, stud and tap bolts, which are now at 75, and 5 per cent off list. Tire bolts have been advanced to 60 and 5 per cent discount. With increased cost for labor, manufacturers claim that recent bolt and nut prices have been

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below the cost of production. Efforts will be made to get better prices from automobile manufacturers who buy special bolts that are not covered by the regular discount and who, it is claimed, have been placing orders at ridiculously low prices. Bolt and nut business in February fell off about 20 per cent as compared with January. Present rivet prices are expected to be reaffirmed this week for the second quarter.

Fluorspar

Recent lack of business in any volume has resulted in sharp price reductions. Domestic fluorspar is now available at $13 per ton for all-rail shipment and $16 for barge shipment, a decline of $3 a ton for the former and $1.50 for the latter. No. 2 lump fluorspar has declined from $1.50 to $2 a ton.

Bars, Plates and Shapes

Bars continue to move in fair volume to parts makers and agricultural implement manufacturers. Miscellaneous demand for shapes and plates from manufacturing consumers is slightly more brisk. Fabricated awards include 240 tons for Nickel Plate bridges and 225 tons for an industrial plant in West Virginia. Cleveland will ask for bids shortly for 13 miles of 12-in. steel or cast iron pipe for a sewage line connecting the Easterly and Southerly sewage disposal plants. Several new projects have come out requiring small lots of reinforcing bars.

Scrap

Prices again have weakened on steel-making grades, which are quoted at 25c. a ton lower than a week ago. Cast scrap has declined 50c. a ton. Sharp restrictions on shipments by Youngstown district consumers and some restrictions by a Cleveland steel plant, as well as the absence of any new demand, have caused the present unsettled state of the market. Another factor that is contributing to the weakness is that milder weather is making the movement of scrap easier and the supply has taken a spurt and is far in excess of present requirements.

Rails to Be Placed In St. Louis District

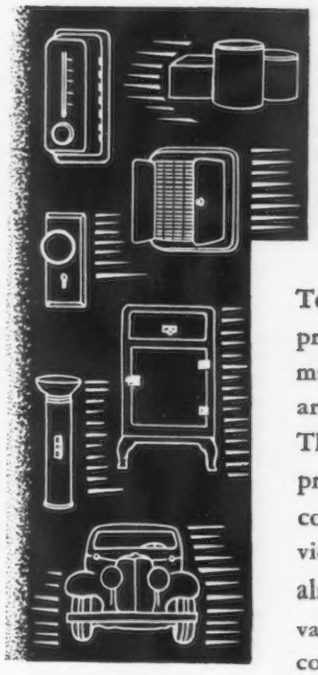
ST. LOUIS, March 5.—It is understood that the rail purchases of the Missouri Pacific and its subsidiaries for 1935, will total approximately 10,000 tons. This tonnage will be laid this year, together with a carry-over of approximately 10,000 tons from preceding purchases. As noted, this and other purchases were authorized by the Federal Court here. The Kansas City Southern is inquiring for 2000 tons of 127-lb. rails.

Warehouse business for February is estimated at about 25 per cent ahead of last February and from 10 to 12 per cent greater than in the preceding month, despite the shorter period. While mills report business is quiet, the volume is stated to be ahead of the first two months of last year.

The scrap iron market is weak, but prices are nominally unchanged because of lack of business. Buying is confined to dealers, and they are buying only enough material to cover current orders. The St. Louis-San Francisco sold approximately 1500 tons last week.

Shipments of pig iron for the first two months of the year are said to be substantially ahead of the same period a year ago. Stove plants are turning their attention to the manufacture of gas heaters, and their average operations in this district are from three to four days a week. Jobbing foundry business is said to be improving.

FINER APPEARANCE



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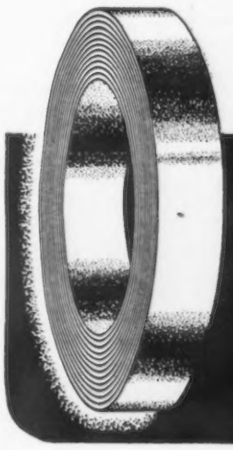

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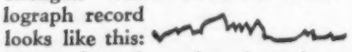
Current fluctuations in your arc welder mean uneven heat . . . irregular penetration . . . variations in metal fusion . . . lack of uniform strength. That's when the oscillograph record looks like this:  It's uniform heat that determines the strength and quality of your welds. When the oscillograph record looks like this: the welds will be of uniform penetration and density. And they'll be uniform from one weld to another.

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Belgian Trade Agreement Menaces the American Steel Worker

(CONCLUDED FROM PAGE 45)

cannot, of course, be prophesied. But it can at least be said that importers of foreign steel were never better organized to extend their trade in the United States than they are at the present time.

The menace to the American worker of heavier imports is better understood when it is considered that 30 to 50 man-hours are required to produce a ton of finished steel, according to the nature of the product. In terms of employment at our mills, even as little as 10,000 tons of foreign steel wipes out 300,000 to 500,000 man-hours. But if does not stop with the steel worker. For every ton of finished steel produced 5 to 6 tons of raw material must be produced and shipped. Workers in iron and coal mines, quarries, scrap yards, and on Lake boats and railroads are deprived of employment.

A Market for Automobiles or Bicycles?

It will be argued, of course, that this loss will be more than offset by increased consumption of steel by automobile manufacturers, farmers and others who expect to benefit by the Belgium agreement. That remains to be seen. The low living standards of Belgium do not promise much in the way of a mass outlet for automobiles. The average European workman regards himself lucky if he can afford a bicycle.

But the spirit of experimentation is still in the air. Having tried NRA, the Administration is apparently disposed to try a dose of tariff reduction. Possibly theory will not bow to reality until we go it "whole-hog" and entirely eliminate trade barriers. The deflationary effect would be terrific and would be directly counter to all of the Administration's efforts to "reflate." In the end, American labor would be driven down to European standards, though this would probably not happen before American stockholders had lost most of their equities in our industries. A costly lesson would be learned, but it would be learned for all time.

Titanium Pigment Co., St. Louis, has developed a process for reclaiming the pickling solution used in steel mills. The treating plant was built by the Chemical Construction Co., and the process converts the ferrous sulphate into sulphuric acid and a residue cinder of iron oxide, the former one of the basic chemicals of industry and the latter much used in paints.

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Opening of Books Fails to Stimulate New York Mart

No Marked Change in Flow of Business —Atlantic Coast Line Places Rails— Belgian Agreement Is Disturbing

NEW YORK, March 5.—The opening of second quarter books resulted in no marked change in the flow of steel business in this district. Tin plate releases continue to be in good volume but demand for pipe, structural steel and railroad materials remains erratic.

The Atlantic Coast Line has ordered 5000 tons of rails from the Carnegie Steel Co. The New York Central took Clayton act bids Feb. 28 on 20,000 tons of rails and 9500 tons of fastenings, and will possibly announce awards some time this week. Bids will be taken March 14 on 32,500 tons of structural steel for suspended spans and approach viaducts for the Tri-Borough bridge, New York. Inasmuch as the contract for the piers which were awarded last month has not yet resulted in the placing of steel, it is feared that the letting of March 14 may run into similar political complications. The contract for the piers was let to Frederick Snare Corpn., New York, and called for about 600 tons of reinforcing bars, 500 tons of steel piling and about 800 tons of caisson plates.

The Belgian trade agreement announced last Friday has created considerable alarm among American mills because the reduction in duties granted to Belgium will automatically apply to other countries under the most-favored nation clause. The duties on most of the commoner finished steel items with the exception of structural shapes have been reduced $1 to $3 a ton. Even now foreign steel is being sold in this country at from $4 to $5 a ton below the delivered prices on domestic steel, and total sales of imported material in this region are estimated at 3000 to 4000 tons a month.

Pig Iron

Opening of books for second quarter on March 1 was expected to develop some activity in this market, but most sellers were largely disappointed. One company booked a fair amount of forward business and brought the week's bookings to about 5000 tons, most of which was second quarter iron. For March delivery only about 1500 tons was taken, comparing with 1150 tons in the preceding seven-day period. It is evident, however, that contract buying will continue to be exceptional and that consumers generally are going to persist in their former policy of buying only for immediate needs. As yet, those needs seem to show little tendency to expand. The possibility of a bituminous coal strike on April 1 may become a market factor, but has not yet affected buying to any appreciable extent.

Reinforcing Steel

Bookings have been negligible in the last week, having been confined to small lots for post offices and miscellaneous work. No orders for 100 tons or more have been reported. The Frederick Snare Corpn. will probably sublet the reinforcing bars on the Tri-borough bridge job on which it will secure the contract when political complications are ironed out. Road mesh is extremely dull, and little new business is expected to appear before the end of the month.

Scrap

The New York district market has begun to reflect the weakened domestic situation in the Pittsburgh and eastern Pennsylvania districts, and No. 1 heavy melting steel has declined 50c. a ton on domestic purchases. The No. 2 grade is also weaker and heavy breakable cast is off 25c. a ton. The export situation has not changed materially, as demand is well sustained and brokers are still hampered by the late arrival of boats for loading.

Pipe Lines

General Petroleum Corpn., Los Angeles, has awarded 8100 tons of 10¾-in. seamless steel pipe as follows: 4100 tons to National Tube Co., 3200 tons to Youngstown Sheet & Tube Co., 800 tons to Spang-Chalfant Co.

Central Kentucky Natural Gas Co., Lexington, Ky., has authorized natural gas steel pipe line system in South End district, including main line from present terminus at Cherokee Park.

Boulder, Colo., has let contract to J. S. Schwartz Construction Co., Colorado City, Colo., for 4200 ft of 16-in. steel pipe from Boulder Canyon district to Canon Park, for water trunk line at $17,953.

Louisville Gas & Electric Co., Louisville, plans steel pipe line extensions and re-

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placements in gas distribution system in differents parts of city. Work will be carried out in connection with annual electric and gas construction and improvement program, for which gross fund of $507,000 has been arranged.

Bureau of Reclamation, Denver, asks bids until March 20 for two 42-in. welded plate steel pipe lines for outlet pipes for spillway and outlet works of Agency Valley Dam, Vale Project, Ore. (Specification 616).

Canton, Miss., let contract to Bethlehem Steel Co. for 112,000 ft. of 6⅝-in. steel pipe for main trunk line from Jackson, Miss., natural gas fields to Canton, for gas supply at latter place. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Victor, Idaho, plans 15,000 ft. of 6-in. steel pipe for main water supply line; also smaller pipe for distribution lines. Financing has been arranged. C. R. Black, Idaho Falls, Idaho, is consulting engineer.

Clare, Mich., is considering welded steel pipe line from McKay-Mercier gas fields, Clare County, to city, about 11 miles, for municipal natural gas supply. Jesse Hampton, mayor, has been authorized to make surveys and estimates of cost.

Railroad Equipment

Chicago & North Western has made application to Interstate Commerce Commission for authority to borrow $1,500,000 from RFC to finance repairs to 115 locomotives and 2000 automobile cars and other maintenance work.

Southern Pacific Co. has divided an order for 158,000 bolts and 6200 kegs of spikes between Colorado Fuel & Iron Products Co. and Pacific Coast Steel Corpn.

Northern Pacific has awarded 1860 tons of tie plates to Pacific Coast Steel Corpn. and 4000 kegs of spikes to Pacific Coast Forge Co.

RAILS

Missouri Pacific and subsidiaries will buy 10,000 tons of rails.

Atlantic Coast Line has ordered 5000 tons of rails from Carnegie Steel Co.

Erie contemplates entering the market for about 20,000 tons of rails.

Kansas City Southern is inquiring for 2000 tons of 127 lb. rails.

Gulf, Mobile & Northern has bought 3218 tons of rails and 700 tons of rail accessories from Tennessee Coal, Iron & Railroad Co.

Virginian has ordered 2200 tons of rails from Bethlehem Steel Co.

Sheet Demand Rises At Cincinnati

CINCINNATI, March 5.—The first rush of orders for second quarter indicates still broader demand for finished sheets. While automotive ordering continues to lead in weekly bookings, electrical and jobbing demand is moving steadily upward. The leading interest is maintaining rolling schedules at about 90 per cent of capacity, and second quarter bookings portend steady operations well into April. In fact, all units are full except hot rolling mills at Butler and some units at Zanesville. A slight tendency to anticipate needs, at least more noticeable than heretofore, features early bookings, indicating a consumer conviction that business is again on the uptrend. Inventories on rejects and waste are lower than at any previous time and prices on these are up $2 to $8 a ton for delivery after April 1.

Demand for pig iron in the second quarter, according to early activity, will continue to reflect prompt needs. The number of small orders, however, increased, raising total bookings to about 1000 tons. Inquiries of small size are numerous. The melt is broadening, with heavier operations in agricultural implement foundries tending to offset spottiness in the jobbing melt.

The movement of foundry coke is tapering. Prices on by-product foundry coke have been affirmed at $9.30 for March delivery in Cincinnati.

The district scrap market is softer. Mill embargoes have virtually stopped the movement of scrap, with a consequent dealer reluctance to speculate on yard inventories.

Seek To Make Labor Unions Liable

ST. LOUIS, March 5.—A suit to establish that labor unions may be sued, contrary to the accepted common law rule, has been filed in Circuit Court here by the General Tile & Marble Co., which asks $5,500 actual and $500,000 punitive damages against the American Federation of Labor, the Building Trades Council and the Bricklayers, Masons' and Plasterers' Union, and others.

The petition describes labor unions as voluntary unincorporated associations for the protection of their members, with no power to sue or be sued, but that certain powers have been conferred on the unions by statutes which would hold them to be suable entities.

Among the reasons cited in the petition as making labor organizations liable to suit and recovery are: That funds of labor unions are held for charitable purposes and not subject to State tax; that unions are not required to make a deposit with the State Treasurer covering funds; that unions are not required to comply with insurance laws in providing free burial for members; that union dues are exempt from taxation; that the State law requires that one of three members of a Board of Mediation and Arbitration, under the Department of Labor, shall be a union member, and that unions may operate under an adopted name or design without registering same with the Secretary of State.

The suit grew out of the loss by the plaintiff of its contract to supply tile for a city building because of a labor dispute. The city, the general contractors and the company which obtained the subcontract for the tile work also are defendants.

TRADE NOTES

American Brake Shoe & Foundry Co., New York, has purchased plant and equipment of the Railway Materials Corpn., Toledo, Ohio. Plant will be known as the Toledo plant of American Brake Shoe & Foundry Co., and will be operated under the direction of W. H. Winters, vice-president in charge of operations. American company without delay will be in a position to furnish brake shoes and grey iron castings to railroads in territory formerly served by Railway Materials Corpn.

Columbia Tool Steel Co., Chicago Heights, Ill., is moving its Chicago branch office and warehouse to larger quarters at 326-328 North Western Avenue. Thomas G. Dougall is in charge of Chicago territory.

Sprout, Waldron & Co., Inc., Muncy, Pa., manufacturer of crushing, grinding, sifting, mixing, elevating, conveying and power transmission machinery, has appointed Conite Engineering & Sales Co., Nashville, Tenn., as sales agent for Tennessee and parts of Kentucky and Alabama.

Carboloy Company, Inc., manufacturers of Carboloy cemented carbide tools and dies, reports orders entered for January, 1935, as representing an increase of 125 per cent over January, 1934. The number of men on the factory payroll on Jan. 31, 1935, was 86 per cent in excess of the number on the same date in 1934.

Standard Fuel Engineering Co., 667 Post Avenue, South, Detroit, has installed new rotary dryer. All clays used in the manufacture of Zero cements are completely dried before being ground to proper mesh.

Benjamin Electric Co., Des Plaines, Ill., has purchased a second 6 x 12 ft. gas-fired porcelain enameling furnace from the Ferro Enamel Corpn., Cleveland. Furnace is equipped with full Alundum "V" bottom muffle and automatically controlled gas burners, and charging equipment will consist of heavy-duty electrically operated Ferro charging forks, with two American-Ferro unloaders. This is a duplicate of similar installation made four months ago.

Railroad Safety Appliance Industry — W. W. Salmon, General Railway Signal Co., New York; George A. Blackmore, Union Switch & Signal Co., Swissvale, Pa.; Lowell R. Burch, New York Air Brake Co., New York; Paris R. Forman, National Pneumatic Co., Rahway, N. J.; William C. Peyton, Standard Stoker Co., Inc., New York; Charles A. Rowan, Westinghouse Air Brake Co., Wilmerding, Pa.; T. George Stiles, T. George Stiles Co., Arlington, N. J.

Ornamental Iron Shop, 40 Main Street, Springfield, Mass., has been made western Massachusetts distributer for Gehret Co., Inc., line of diamond mesh cloth and diamond framing bars.

Gould Storage Battery Corpn., Chicago, manufacturer of lead acid storage batteries for all types of application or service, has opened new district office and service station at 227 Garvey Court, Chicago.

Hexcel Radiator Co. has moved plant and offices from Milwaukee to Racine, Wis.

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FRANK T. SISCO, *Editor*

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For the construction engineer and architect, there is a complete unbiased discussion of the corrosion resistance of low-copper steel, now extensively used for sheet and structural members, and a comparison of the value of this steel with other low-cost materials.

Such a correlation of the literature as is attempted in this book puts at the disposal of the reader all essential data on the use of copper in the iron and steel industry, information now scattered through volumes of journals and text books in many languages. It assembles this information in concise form and insures that nothing pertinent will be missed.

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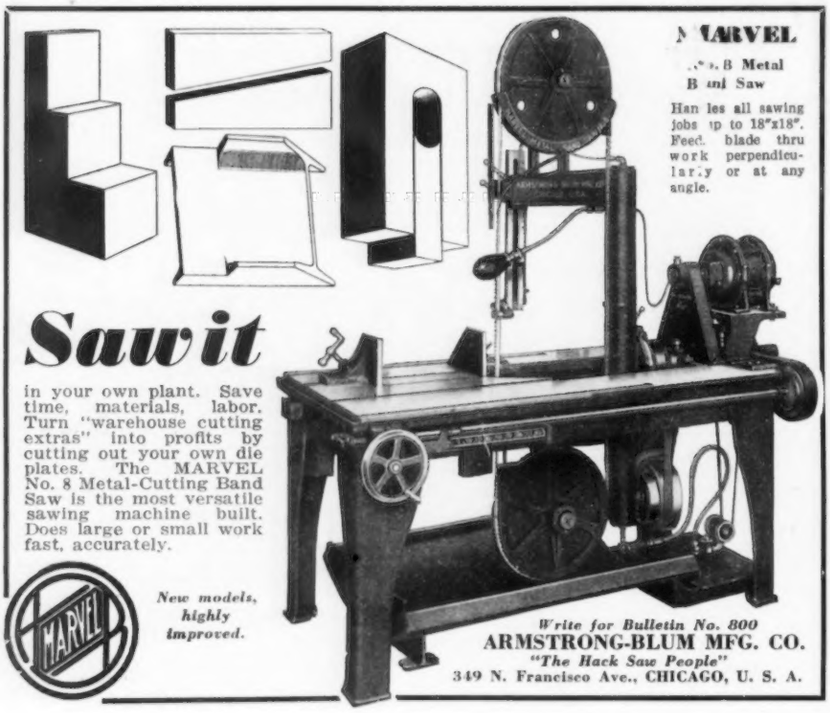
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OBITUARY

JOHN S. KEEFE, who retired Dec. 31, 1932, from the presidency of the American Steel & Wire Co., died suddenly in his home at Oak Park, Ill., on March 3. He was born Jan. 24, 1864, and received his schooling in Boston. One of his first jobs was that of clerk for the Chicago & North Western Railway at Milwaukee and later at Escanaba, Mich. In 1887 he became general freight agent for the Canada & St. Louis Railway, now a part of the New York Central System. In 1888 he entered the steel industry in the traffic department of the Union Steel Co., which a year later became a part of the Illinois Steel Co. He resigned as traffic manager of the Illinois company in 1899 to become General traffic manager of the American Steel & Wire Co. In 1901 he was made a vice-president and a director of the company and he was elected president Dec. 28, 1927. He served as chairman of the traffic committee of the United States Steel Corpn. from 1903 to 1928. L. J. Gray, who was his assistant when he was president of the American Steel & Wire Co., died on the same day.

J. S. KEEFE

❖ ❖ ❖

LESLIE J. GRAY, assistant to the president of the American Steel & Wire Co., Cleveland, died March 3, aged 58 years, after a two weeks' illness with a heart ailment. Mr Gray was a native of Chicago and graduated from the Engineering department of Cornell University in 1896. After leaving college he was connected for two years with the Illinois Steel Co. as draftsman and later as clerk in the cost department. From 1898 to 1902 he was assistant superintendent of the Carborundum Co., Niagara Falls, N. Y. He became associated with the American Steel & Wire Co. in Pittsburgh in 1902 in a clerical capacity and in 1910 became assistant to the general superintendent. He was transferred to Cleveland in 1927 as assistant to the president.

CHARLES S. FARQUHAR, president of Lynd-Farquhar Co., Boston, which he founded in 1917, and also a partner in the small tool firm of Chandler & Farquhar Co., died in Miami, Fla., on Feb. 8, aged 80 years.

❖ ❖ ❖

WILLIAM S. ELLIOTT, president, Elliott Co., Pittsburgh, machinery manufacturer, died at his Pittsburgh home on Feb. 21, aged 72 years. Nine years after his graduation from Cornell in 1887, he went to Pittsburgh and founded the Liberty Co., later forming the Elliott Co. He was a director and vice-president of the Lagonda Mfg. Co. at Springfield, Ohio, and the Liberty Mfg. Co., Pittsburgh. He was a member of the American Society of Mechanical Engineers, the Engineers Society of Western Pennsylvania and the Engineers Club of New York.

W. S. ELLIOTT

❖ ❖ ❖

FRANKLIN MOELLER, manager of the New York office of the Wellman Engineering Co., Cleveland, died in the General Hospital, East Stroudsburg, Pa., Feb. 24, from injuries received in a traffic accident a few days before. He was 70 years of age. Mr. Moeller had been connected with the Wellman company and its predecessors about 40 years. He served most of the time in the engineering department in Cleveland and was transferred to New York six years ago.

❖ ❖ ❖

M. FRANK RYAN, vice-president and Western representative of the Pittsburgh Spring & Steel Co., died Feb. 16 at his home in Chicago. He was 69 years old. He was born in Sterling, Ill., and had been connected with the steel company for 32 years.

One Era in Railroad Equipment Completed — Is Another Beginning?

AN era in railroad equipment has been completed—the era of conversion from wooden cars to steel cars. This illuminating fact was brought out in an address, illustrated by lantern slides, which was delivered by C. B. Peck, managing editor, *Railway Mechanical Engineer*, before the New York Railroad Club Feb. 15.

Now that one cycle has reached an end, will another get under way in which high-tensile materials will replace carbon steels as car-

(Continued on Page 70)

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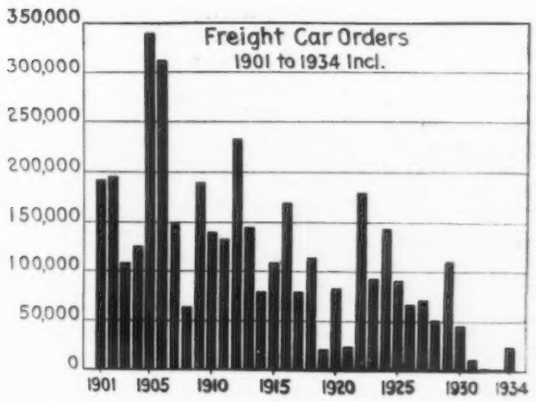


FIG. 1

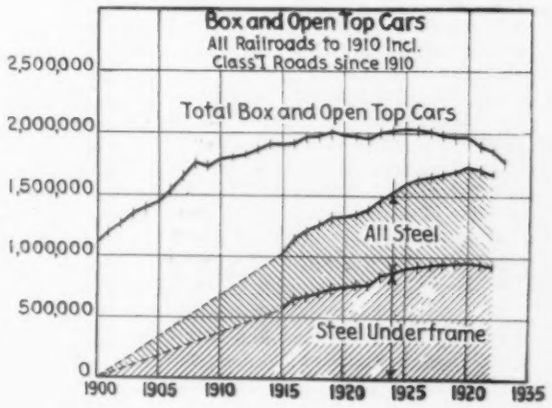


FIG. 2

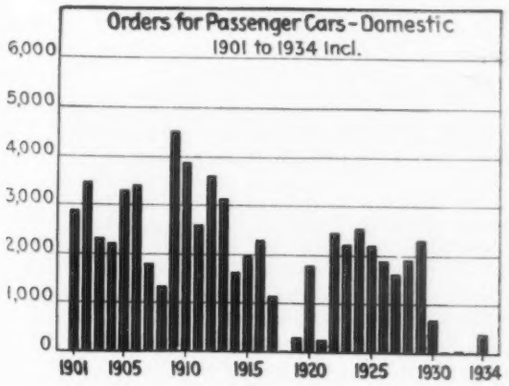


FIG. 3

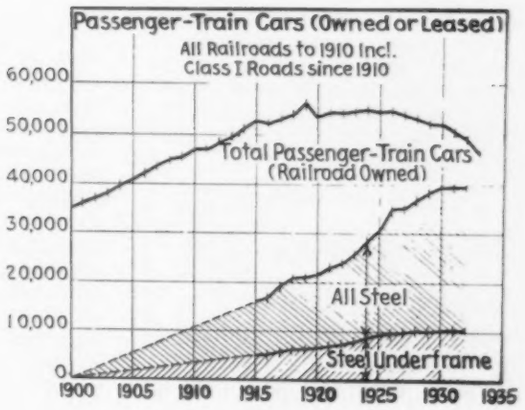


FIG. 4

bon steels replaced wood? Mr. Peck did not attempt to answer this question, confining himself to an exposition of what has taken place in the period since 1900, when the steel car era began. In the early years of that era, he pointed out, orders for both freight and passenger cars were exceptionally heavy. Subsequently they underwent a gradual decline, even during the years before the depression. The trend of car orders since 1900 is shown in Fig. 1 and Fig. 2.

Fig. 3 and Fig. 4 show cumulative orders for all-steel and steel-underframe cars and compare them with the total number of cars in service. For both freight and passenger equipment the intermediate curve, representing the combined number of steel-underframe and all-steel cars, approached the top curve, representing total cars owned, at the close of the period under review. In the words of the speaker, the job of the era has been completed—the need of replacing cars of wooden construction with those of steel has been largely satisfied.

To Demonstrate Cost Of Power Drives

DEMONSTRATIONS of power cost of group drives and of individual motor drives are being made in various cities by the Power Transmission Council. A special model is used to show the character of the loads.

The schedule as now planned calls for visits as follows: Dallas, Tex., Webb W. Snowden, week of Mar. 4; Houston, Tex., J. M. Delz, week of Mar. 11; New Orleans, J. L. W. Gordon, week of Mar. 18; Birmingham, E. D. Scott, week of Mar. 25; Atlanta, Ga., E. D. Key, week of April 1; Greenville, S. C., C. C. Anderson, week of April 8.

Agricultural Steel Demand Looking Up

INCREASE of an estimated $1,000,000,000 in farm income during 1934 created the largest demand for steel for agricultural uses since 1929, according to the American Iron and Steel Institute. THE IRON AGE estimated that 1,400,000 tons of steel went into farm equipment last year, or more than seven per cent of the finished steel produced. This is the largest percentage of the total production required for agricultural uses in any recent year.

Recent inquiry among leading farm implement manufacturers by the institute indicated that prospects in this field look bright for even better business in 1935 than in 1934. The value of farm implement production was approximately $170,000,000 in 1934, about 50 per cent above the preceding year. Forecasters generally agree on a volume of output valued at $250,000,000 as the expectation for the current year.

Consumption of steel on farms is not limited to implements like combines, harvesters, plows, windmills and tractors which are mostly steel. Fencing, bale ties, roofing sheets, eaves troughs and gutters, steel culverts, water troughs and tanks, and hand tools are among the many other steel products demanded by the farm market. Recently developed steel barns, silos, cribs and small buildings may open the market for sheets and light shapes still further, as may the anticipated acceptance of steel-framed or all-steel houses.

Bethlehem Pension Payments $800,000

PENSION payments by Bethlehem Steel Corpn. to retired employees during the past 12 years have totaled $6,754,721, and more than $800,000 was paid out during the past year, according to the annual summary of employees' representation activities contained in the *Bethlehem Review*.

The employees' relief plan, which has been in operation nearly nine years, disbursed during the year $934,828 in sickness and death benefits to more than 6100 participants or their beneficiaries. In the Bethlehem organization, pension, relief and other activities are all developed through the employees' representation plan in each plant, this form of relationship having been in effect in the Bethlehem activities for the past 16 years. Referring to the current interest and progress in collective bargaining, the *Bethlehem Review* comments:—

During the past year the employees' representation plans have continued to serve as effective agencies for collective bargaining. Not only have the representatives elected under these plans guided the various beneficial plans described above but they have also handled 814 cases of record concerning hours, wages and working conditions of their fellow employees.

Many more cases which were not of record were handled by the employees' representatives satisfactorily to the employee, without need for formal action.

The plans in the various plants of Bethlehem which have been in successful operation for some time and in some cases for more than 16 years have had perhaps their most active period during the past year.

Army Method Applied to Production Control

(CONCLUDED FROM PAGE 11)

the order number. As the job progressed from department to department the date when it left the previous department was filled in under that particular department heading.

What Was Accomplished

The vital information that this "Visual Production Interference Method" divulged is as follows:—

1. At all times the method immediately gave a bird's eye view of the activities of the center plant.

2. It set forth the various points at which the production flow was being dammed up.

3. It gave the causes of such damming up.

4. It determined the operating efficiency of each department as indicated by the production capacity in operation against the total available production capacity.

5. It immediately brought to light that portion of the production equipment which shouldered the brunt of production activity. It also strikingly set forth all equipment which, because of obsolescence, inadequacy, under-capacity or over-capacity, remained idle.

6. It set forth the efficiency of the department heads, in the selection of the proper equipment for a given job.

7. It checked the selective ability of those responsible for the purchase of the equipment.

8. It checked the efficiency of every department contributing directly or indirectly to the processing because it impartially established the cause of interference and the duration of time before this interference was cleared, allowing flow of production to continue.

9. It pictorially illustrated the flow of production at all times. Therefore short cuts could be discerned and inaugurated.

10. It illustrated at all times the available floor capacity against the floor capacity in use, thus allowing the pre-planning for peak load conditions by the transfer of equipment from one department to another.

11. It placed at the finger tips of the administrative staff all the factors so vitally necessary to be known for the most efficient administration of a manufacturing organization.

12. It revealed carelessness in the operation of equipment, by the number of machines requiring servicing, by the number of accidents occurring, and the frequency with which these causes occurred.

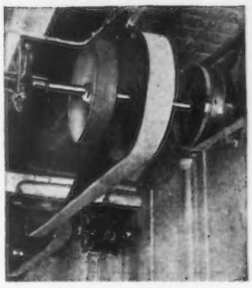
It seems that this method is only limited by the ingenuity of the person inaugurating it, for uncovering all sorts of data with reference to the operation of a producing unit.

If the complexity of an organization can be analyzed and broken down into its elements of activity there is no reason to suppose that the elements cannot be checked by this method.

The Wesley Steel Treating Co., 1333 West Pierce Street, Milwaukee, has acquired an exclusive license until 1941 in Wisconsin and coastal cities of Michigan for use of the special case-hardening process known as "Chapmanizing," owned by the Chapman Valve Co., Indian Orchard, Mass. Additions, 20 x 74 ft., to house new processing units of the continuous pusher furnace type, are being completed at its two shops in Milwaukee.

Schieren

Belting GIVES YOU AN EXCELLENCE OF PERFORMANCE THAT IS POSSIBLE ONLY THROUGH— SCHIEREN-IZING



Always Dependable

the process of manufacture that gives to Schieren Belting, its exceptionally long service life and dependability. Most important are its unusual pliability, high tensile strength, and glove-like pulley grip that make for low maintenance and operating cost. Write for prices and description of this better belting.

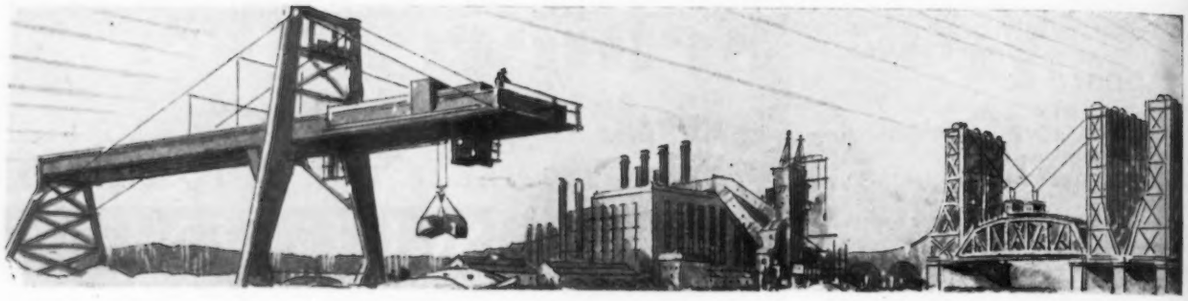
BELTING
Chas. A. Schieren Company
Tanners and Manufacturers of
LEATHER BELTING, PACKINGS and SPECIALTIES
Main Office and Factory:
37 FERRY STREET NEW YORK
Branches and Distributors in All Principal Cities

Ford Reiterates High Wage Beliefs

IN a letter to Matthew Woll, third vice-president of the American Federation of Labor, Henry Ford has again advocated high wages. Mr. Ford predicts that "opportunities for skilled employment will tend steadily to increase" as a result of new machinery and better management and says that wages will not only "continue to go higher" but "in these classifications wage rates will go higher than we have yet seen, with consequent increases for men in the lower classifications."

Mr. Ford denies that "production costs are ever really decreased by reducing wages" and asserts that "higher wages have usually brought lower costs." Declaring that "unless the worker in American industry is enabled to use and enjoy the products of industry, the natural balance cannot be maintained," Mr. Ford takes the position that "our only market is our people." He also pays his compliments to "politics" and to absentee ownership.

Calling Mr. Ford's attention to the fact that he believes a movement of leading industrialists against high wages is under way, Mr. Woll asked him if he would be willing to state his position as to wages at the present moment.



Plant Expansion and Equipment Buying

Heavy Machinery Has Buoyant Undertone

BRISK inquiry of a substantial nature for heavy machine tools has given a buoyant undertone to last week's activities. Planer and boring machine makers report prospects as good and in some cases are increasing their labor forces. Demand for milling machines and grinders is better, with foreign orders in sizeable proportion.

Announcement of the large programs of modernization by steel producers is undoubtedly responsible for the more optimistic outlook for heavy equipment. The Youngstown Sheet & Tube Co. has taken quotations against the list published in last week's issue of THE IRON AGE and it is expected that business will be placed during the coming week.

◀ NEW ENGLAND ▶

Chemical Paper Mfg. Co., Jackson Street, Holyoke, Mass., plans new hydroelectric power plant at paper mills. Cost about $125,000 with equipment. Work will begin late in spring. R. L. Bosworth is manager of power and maintenance.

Board of Education, City Hall, Providence, R. I., plans manual training department in new three-story and basement senior regional high school on Mount Pleasant Avenue, for which bids are being asked by Board of Contract and Supply, City Hall, until March 11. Cost about $1,000,000. I. S. Gorman, address noted, is city architect. Richard D. Kimball Co., 6 Beacon St., Boston, is mechanical engineer.

Marbelite Co., Wallingford, Conn., has been organized by John F. Burghoff, Masonic Avenue, and John B. Wilks, 61 Academy Street, to manufacture metal products.

Freizer Brothers, Inc., Oakville, Conn., has recently started operations at former plant of Autoyre Co., manufacturer of metal stampings, enameled metal bath fixtures, etc., and will continue kindred line of production. Improvements have been made in plant and equipment.

City Council, Calais, Me., plans new municipal airport, for which tract of about 15 acres has been acquired, including hangar with repair and reconditioning shop and other field structures. Cost over $40,000. E. J. Corrigan, mayor, is active in project.

Johnston Auto Body Co., Springfield, Mass., has been organized by Robert V. Johnston, 780 Worthington Street, and associates, to manufacture automobile bodies.

◀ NORTH ATLANTIC ▶

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, has purchased plant of Railway Materials Corpn., Toledo, Ohio, and will remodel for new branch works. Company also operates another Toledo plant under name of Southern Wheel Co., Westwood Avenue, where expansion and improvements have been carried out, totaling over $400,000 with equipment.

Mohican Steel Co., Inc., 300 Meserole Street, Brooklyn, has leased building at Forty-seventh Avenue and Thirtieth Place, Long Island City, for new storage and distributing plant.

Standard Brands, Inc., 595 Madison Avenue, New York, distiller and food products manufacturer, has leased two-story and basement building, 100 x 150 ft., to be erected by Louis Richter, Cincinnati, on Ridgeway Avenue, that city, for new factory branch, storage and distributing plant. Ferro Concrete Construction Co., Third and Elm Streets, Cincinnati, is general contractor. Cost close to $100,000 with equipment. Potter, Tyler & Martin, 35 East Seventh Street, Cincinnati, are architects. Local offices of company are at 419 Plum Street.

Krauss Iron Works, Inc., New York, has been organized by Adolf Krauss, 424 Eleventh Street, and Charles L. Schmid, both Brooklyn, to manufacture iron and other metal products.

Robert Gair Co., 155 East Forty-fourth Street, New York, manufacturer of corrugated and other containers, has acquired Corrugated & Container Co., Ltd., Hamilton, Ont., and Concord Shipping Containers, Ltd., Toronto, both manufacturers of allied products. Increased operations will be carried out.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 12 for boiler safety valves (Schedule 4395); until March 15, six fuel oil heaters and spare parts (Schedule 4436), electric-operated valves and spare parts (Schedule 4439); until March 19, two emergency power switchboards and spare parts (Schedule 4456), all for Brooklyn and Charleston navy yards; until March 12, 2106 water gage glasses (Schedule 4383) for Brooklyn, Philadelphia, Boston, Norfolk, Mare Island and other yards; until March 15, eight air compressors and spare parts (Schedule 4435) for Brooklyn and Philadelphia yards; and one motor-driven surface grinding machine (Schedule 4469) for Brooklyn yard.

Vita Food Products, Inc., 99 Hudson Street, New York, has leased eight-story building at 644-54 Greenwich Street, totaling 100,000 sq. ft. floor space, and will remodel for new storage and distributing plant. A refrigerating plant will be installed.

Tri-Boro Steel Supply Co., Inc., Bronx, New York, has been organized by Thomas J. Flanagan, 7920 Ridge Boulevard, Brooklyn, and Bernard A. Gunn, 2 Pinehurst Avenue, New York, to manufacture steel springs, rods, wire netting, etc.

H. Rinder Plumbing Supply Co., 3727 Third Avenue, Bronx, New York, Henry M. Rinder, head, has filed plans for new one-story factory, 56 x 131 ft. Sampson Levy, 341 East 149th Street, is architect.

Board of Education, Whitney Point, N. Y., plans manual training department in new multi-story school, for which bids will be asked soon on general contract. Cost over $300,000. A. F. Gilbert, 358 Fifth Avenue, New York, is architect.

Essex County Board of Freeholders, Hall of Records, Newark, N. J., will soon take bids for extensions and improvements in power plant at Overbrook Hospital, Cedar Grove, N. J., including two new turbogenerators and auxiliary equipment. Fund of $125,000 has been secured through PWA. Runyon & Carey, 31 Fulton Street, Newark, are consulting engineers.

Walworth Co., 574 Raymond Boulevard, Newark, manufacturer of valves and kindred products, with main plant at Boston, has leased about 25,000 sq. ft. floor space in former plant of A. A. Wire Co., Harrison, N. J., for new factory branch, storage and distributing plant. Newark plant will be removed to new location.

Dover Boiler Works, East Dickinson Street, Dover, N. J., manufacturer of boilers, tanks and kindred products, is considering rebuilding plant recently destroyed by fire. Loss over $250,000 with machinery. William F. Birch is head.

Board of Education, Bayonne, N. J., plans manual training department in new multi-story senior high school, for which bids have been asked on general contract. Cost $1,280,000. Financing has been arranged. Fanning & Shaw, 49 Ward Street, Paterson, N. J., are architects.

Neuco Products Co., Chestnut Street, Hillside, Newark, N. J., manufacturer of hard composition products, plans rebuilding part of plant recently destroyed by

Is Your Equipment Maintaining PRODUCTION SCHEDULES?

Inefficient cutting oils lessen output!

Sunoco Helps Machines Give Rated Capacity

Modern machine tools, built for high output schedules and to afford economies of time and costs, are markedly dependent on the quality of cutting oil used. Inefficient cutting lubricants needlessly lessen output.

It is significant that Sunoco Emulsifying Cutting Oil is chosen consistently by the industry's leaders for its ability to aid machine tools *maintain desired speeds and schedules.*

Accuracy and Better Finish Secured, Too

Not production totals alone, but close tolerances and excellent finish as well are of prime importance. Sunoco's record proves it ideal for obtaining accuracy and fine finish . . . throughout long runs . . . and at high speeds!

Longer Tool Life . . . Less Resetting

Sunoco has the superior qualities which aid small tools in making clean cuts, with long operating intervals before regrinds are necessary. Longer tool life means more operating minutes and hours through less "down time" for frequent resetting. With Sunoco, small tools stand up under severe and unusual metal-cutting conditions.

We suggest that you get the facts on Sunoco. Our engineers are at your service for consultation and recommendations.

THEY CHOSE SUNOCO...

These pictures continue a series of illustrations showing the widespread use of Sunoco, a series presented for the past ten years through the medium of the trade's magazines.

Courtesy Ray Day Piston Co., Detroit

Operation: Rough and finish grooving piston for rings. **Machine**: Sundstrand Automatic Grooving Machine. **Material**: Aluminum. **Speed**: 943 R. P. M. **Size Of Groove**: 1/4 in. by 1/4 in. **Lubricant**: 1 part Sunoco to 50 parts water.

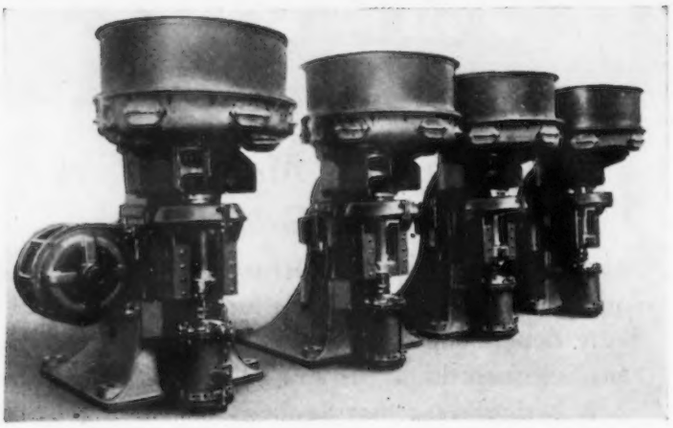
Courtesy Buck & Hickman, Ltd., London. Eng.

Machine: Pratt & Whitney 10 in. Helical Gear Grinder. **Material**: Chrome Nickel Steel. **Wheel Diam.**: 10 in. **S. F. P. M.** 5000. **Stock Removal**: .010 in. **Coolant**: 1 part Sunoco to 40 parts water.

SUNOCO
EMULSIFYING
CUTTING OIL

SUN OIL COMPANY Philadelphia

FARREL ROD COILERS



for rounds or flats

Farrel Rod Coilers are built in two types—the plate lifting type for round rod, and the retracting pin type for flat or rectangular sections.

Both types have modern features of design and construction which assure dependable, efficient operation, with minimum maintenance.

- All moving parts are enclosed for safety.
- Silent chain drive and cut bevel gears are fully enclosed and run in oil.
- All shafts are mounted in anti-friction bearings.
- Bearings are lubricated by Alemite fittings grouped in a single block on the front of the machine, with leads to each bearing.
- Variable speed motor is mounted on adjustable bracket attached to base of machine to provide adjustment for chain drive.
- Plate lifting or pin retracting mechanisms are operated by air.

We are prepared to furnish individual coilers or complete coiler installations with centralized control desk, unloading mechanisms, conveyors, etc. For further information please address

FARREL-BIRMINGHAM
Company, Inc.
100 Main St., Ansonia, Conn.

fire. Loss close to $100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 15 for one motor-driven grinding machine (Schedule 4463), two motor-driven milling machines (Schedules 4461 and 4462), 500 aircraft quantity fuel gages (Schedule 4427), 1075 connection block assemblies (Schedule 4348), 500 aircraft engine gage units (Schedule 4429), 1000 centrifugal aircraft tachometers (Schedule 4428); until March 19, four sets electric revolution counter and timing equipments (Schedule 4440) for Philadelphia Navy Yard; parts for parachutes and parachute equipment (Schedule 4450) for Philadelphia and Quantico yards.

Seaboard Marine Repair Co., Inc., Ferry, Monroe and Newark Streets, Hoboken, N. J., has been organized to take over Capstaff Marine Turbine Repair Co., marine engineer and boiler maker, same address. A. E. Bowers is president.

BUFFALO DISTRICT

Board of Education, North Syracuse, N. Y., plans manual training equipment in new two-story and basement high school. Cost about $130,000. Special election will be held in March to vote bonds in such amount. M. L. King, Dennison Building, Syracuse, is architect.

Charles L. Jacobowitz Corpn., Buffalo, has been organized, capital $100,000, by Charles S. and Theodore M. Jacobowitz, to manufacture brewing machinery, parts and kindred equipment. New company will take over plant and business at 1432 Niagara Street, heretofore operated under name of C. L. Jacobowitz.

Abitibi Power & Paper Co., Ltd., Toronto, Ont., plans remodeling and re-equipping pulp and paper mills at Espanola, Fort William and Sturgeon Falls, Ont., for production of sulphide products for use in manufacture of rayon. Cost over $7,000,000 with machinery.

WESTERN PA. DIST.

United Refining Co., Warren, Pa., has approved plans for expansion and improvements, including additions and equipment to double present capacity of gasoline refinery units. Cost over $85,000 with machinery. Contracts for different equipment are being let.

American Oil Co., Grant Building, Pittsburgh, plans new petroleum products loading and unloading terminal on Monongahela River, near Hays Station, Pa., including tanks and other facilities.

Radio Station WMMN, 325 Adams Street, Fairmont, W. Va., A. M. Rowe, Inc., owner and operator, plans expansion and improvements, including new steel tower, antenna, power equipment, etc. Cost about $50,000.

Brown Fence & Wire Co., 6532 Juniata Avenue, Cleveland, manufacturer of wiring fencing and kindred wire goods, affiliated with Peerless Wire & Fence Co., Adrian, Mich., plans establishment of new branch plant at Parkersburg, W. Va., where property is being acquired.

OHIO AND INDIANA

Ohio River Terminal & Refining Co., Carew Tower, Cincinnati, has plans for new bulk oil storage and distributing plant, including main one and two-story building, 60 x 100 ft., and smaller units, steel tanks and other equipment. Cost over $75,000 with equipment.

Ideal Lamp Mfg. Co., Ashland, Ohio, has been organized by J. R. Ryder, care of Howard S. Lutz, Farmers' Bank Building, representative, to manufacture electric lamps, lighting fixtures, etc.

Construction Quartermaster, Patterson Field, Fairfield, Ohio, is planning appropriation of about $1,000,000 for expansion and improvements at local airport and airfield, including new hangar, 150 x 500 ft., with repair and reconditioning shops, to cost about $600,000 of fund noted, including equipment; new equipment storage and distributing building, radio laboratory and other structures.

Youngstown Brewing Co., Youngstown, Ohio, Harry Weaver, 276 Evergreen Avenue, head, has work under way on remodeling plant recently acquired, for new brewery. Cost about $60,000 with machinery.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 11 for lamp assemblies (Circular 536), 500 synchronizer generator cam follower assemblies (Circular 526), 2600 low voltage capacitors (Circular 531); until March 12, brass wire (Circular 525); until March 14, oil temperature regulator assemblies (Circular 517); until March 15, resistors, condensers, grind clips, transformers, terminals, sockets and vacuum tubes (Circular 535), 575 exhaust collector rings (Circular 521); until March 18, mild carbon bar steel, mild carbon rod steel, medium carbon rod steel, chrome nickel sheet steel, etc. (Circular 478), 474 wheel assemblies and 634 brake assemblies (Circular 527).

Perfect Circle Co., Hagerstown, Ind., manufacturer of piston rings, etc., has let general contract to Carl M. Geupel Construction Co., Hume-Mansur Building, Indianapolis, for three-story addition, 100 x 100 ft., in part for storage and distribution. Cost over $60,000 with equipment. Daniel C. Teetor is plant manager.

SOUTHWEST

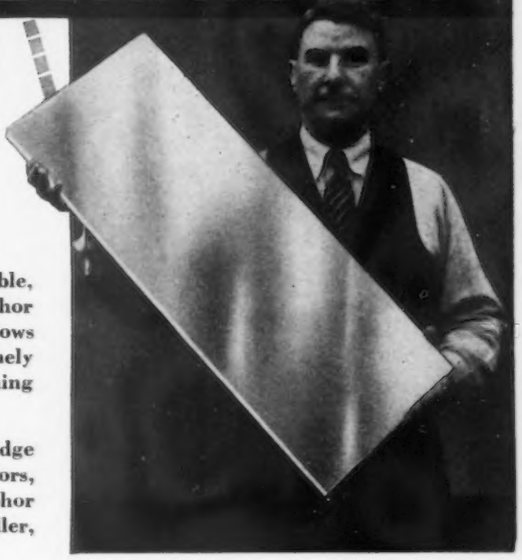
Santa Fe Railroad Co., Topeka, Kan., has approved plans for extensions and remodeling of engine house at Ottawa, Kan., including additional shop facilities.

Board of Education, 911 Locust Street, St. Louis, plans manual training depart-

THE BRIDGE BEARING!

—an outstanding evidence of the toughness and durability that have placed Seymour Phosphor Bronze in thousands of products that

MUST STAND UP!



BRIDGES expand in summer, contract in winter. To prevent trouble, spaces are left between spans and heavy bearing plates of Phosphor Bronze are inserted. Being corrosion-resistant, Phosphor Bronze allows the spans to slide smoothly back and forth on the piers; and, being extremely tough, it supports the great weight of the superstructure without "running out" at the edges.

The purpose here, however, is not to sell Seymour Phosphor Bronze Bridge Bearings, which have long had the acceptance of engineers and contractors, but to stress the fact that the same qualities which make Seymour Phosphor Bronze ideal for bridge bearings make it ideal also for thousands of smaller, less heroic requirements.

The daily pounding of trains and trucks over a bridge is, doubtless, no more disintegrating, relatively, than the millions of hammerlike blows inflicted upon the spring contacts of electric switches. And a very important percentage of the manufacturers of switches use Seymour Phosphor Bronze for contacts because of its lasting resiliency.

The ability to stand wear, fatigue and corrosion has, as a matter of fact, placed Seymour Phosphor Bronze in a very wide bracket of products that must undergo severe and continued punishment . . . . such as the "web" in brake linings—the sash chain in large windows—slow-speed, heavy-pressure bearings—screens for paper-making machinery—and the springs of locks.

Seymour quality is not only high but UNIFORM. Every heat is analyzed and numbered. Tests are then made all along the line of manufacture. If any batch falls short it is identified by its heat number and promptly withdrawn. If such methods appeal to you and you would like to try out Seymour Phosphor Bronze in some of your products, we shall be glad to send you test samples without charge or obligation.

SEYMOUR PHOSPHOR BRONZE

The Seymour Mfg. Co., 24 Franklin St., Seymour, Conn.

SPECIALISTS IN NICKEL SILVER & PHOSPHOR BRONZE

B&L Shafting

Turned and Ground
Turned and Polished
Drawn and Ground
Drawn and Polished

BETTER MADE STEEL LABORATORY TESTED

Write for the new SHAFTING Folder 4-A

THIS bucket loader derives its strength, durability and utility from the basic materials that go into it—and B&L Steel Shafting plays no small part in its construction, contributing to efficiency of operation, as well as to economy in manufacture.

Whatever type of mechanical equipment you build, there is satisfaction in knowing that, with B/L Shafting, you can secure the close tolerances in size, straightness and concentricity which are so necessary in fabricating your product and guaranteeing its performance.

Cold Finished Bars and Shafting
Free-Cutting Screw Stock
Extra Wide Flats
Special Sections
Alloy Steels

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

ment in new three-story and basement Southwest high school, 250 x 269 ft., at Kingshighway and Arsenal Street, for which bids are being asked on general contract. Cost $1,000,000. George W. Singer, address noted, is commissioner of school buildings, in charge.

City Council, Hollis, Okla., is considering new municipal electric light and power plant. Cost about $100,000 with distribution system. Special election will be arranged soon to vote bonds in amount noted.

City Council, Kennett, Mo., plans erection new municipal electric light and power plant, using Diesel engine-generating units, including distribution system, and has secured permission to dispose of bond issue of $120,000. Entire project will cost $165,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Standard Oil Co., 2 West Fortieth Street, Kansas City, Mo., has let general contract to Fogel Construction Co., Reliance Building, for new bulk oil storage and distributing plant. Cost about $35,000 with tanks, pumping plant, etc.

United States Engineer Office, Galveston, Tex., asks bids until March 11 for two 25-kw. steam-driven electric generator sets (Circular 175).

Board of Education, Fort Worth, Tex., plans manual training department in new Rosemont junior high school, for which bids are being asked on general contract until March 14. Cost about $200,000. Elmer G. Withers Architectural Co., and E. A. Van Horn, both Holmes Building, are architect and consulting engineer respectively.

Missouri Pacific Railroad, St. Louis, and subsidiaries, has been authorized to expend $5,584,603 for betterments and improvements, including: Missouri Pacific, shop machinery and tools, $174,000, roadway machinery and tools, $64,500; International-Great Northern, shop machinery and tools, $800, roadway machinery and tools, $5,900; New Orleans, Texas & Mexico, shop machinery and tools, $1,450; St. Louis, Brownsville & Mexico, shop machinery and tools, $4,820.

SOUTH ATLANTIC

Lyons Fertilizer Co., Tampa, Fla., manufacturer of commercial fertilizer, plans rebuilding part of plant recently destroyed by fire. Loss over $200,000 with equipment.

Board of Glynn County Commissioners, Brunswick, Ga., has asked bids on general contract for new hangar, with repair and reconditioning shop, and other mechanical units at proposed new airport. Cost over $75,000 with equipment.

Office of Quartermaster, Atlanta, Ga., asks bids until March 14 for units for portable buildings, totaling about 280 buildings in all (Circular 6).

Scotland Neck Builders' Supply Co., Scotland Neck, N. C., plans rebuilding part of plant recently destroyed by fire. Loss about $50,000 with equipment.

MIDDLE WEST

Northwestern Barb Wire Co., Griswold Street, Sterling, Ill., manufacturer of wire fencing and kindred wire goods, plans erection of several one-story units, including a new rod mill. Cost over $2,500,000 with equipment.

Hoerber Brewing Co., 176 West Adams Street, Chicago, has plans for two-story addition to brewery at 1617 West Twenty-first Place, 25 x 55 ft. Meyer & Cook, 820 North Michigan Avenue, are architects.

C. H. Hollup Corpn., 3333 West Forty-eighth Place, Chicago, manufacturer of welding wire and kindred products, has leased space in building at 2 Industrial Street, Leaside, Toronto, for new branch plant, to be operated by Hollup Corpn., Ltd., recently organized Canadian subsidiary. W. Thornber, vice-president, will be in charge of operations at Toronto.

Arrow Metal Works, Inc., 5843 North Artesian Avenue, Chicago, has been organized by Edward H. Kraus and Edward Blatter, to manufacture metal products.

North West Distillery, Inc., Shakopee, Minn., has plans for remodeling former brewing plant into a distillery, including extensions and new machinery. Improvements will also be made in power plant, with installation of boiler, stoker and other equipment. Cost close to $35,000. W. Glen Wallace, 513 Washington Street, S. E., Minneapolis, Minn., architect, is interested in securing information on distilling machinery.

Common Council, Wayne, Neb., has authorized early call for bids for new equipment for municipal electric light and power plant, including Diesel engine-generator unit and accessories. Cost over $50,000. W. S. Bressler is city clerk, in charge.

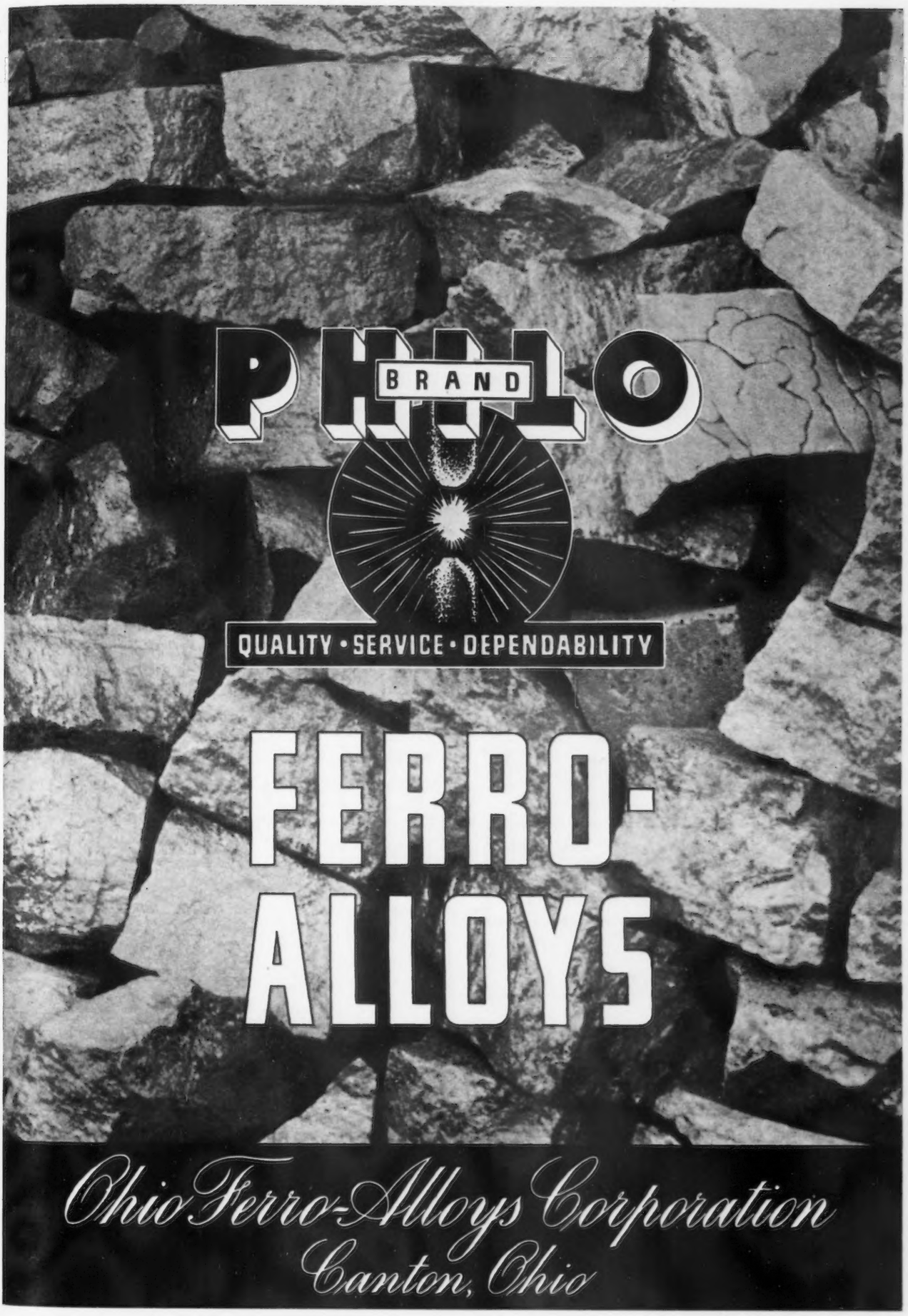
Municipal Water Board, Denver, plans electrification of waterworks pumping station in Capitol Hill district, including installation of new equipment. D. D. Gross is chief engineer.

WASHINGTON DIST.

Procurement Officer, Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until March 21 for one concrete mixer (Circular 99); until March 22, one concrete mixer (Circular 96); until March 25, one concrete finisher (Circular 98).

City Council, Frederick, Md., is considering new municipal incinerator plant. Cost about $150,000 with furnace units, conveyors and other equipment.

Chief of Ordnance, United States Army, Washington, asks bids until March 14 for two vertical shapers, two vertical drills, five turret lathes, three horizontal boring, milling and drilling machines, one universal milling machine, one plain milling machine, four or six surface grinders, one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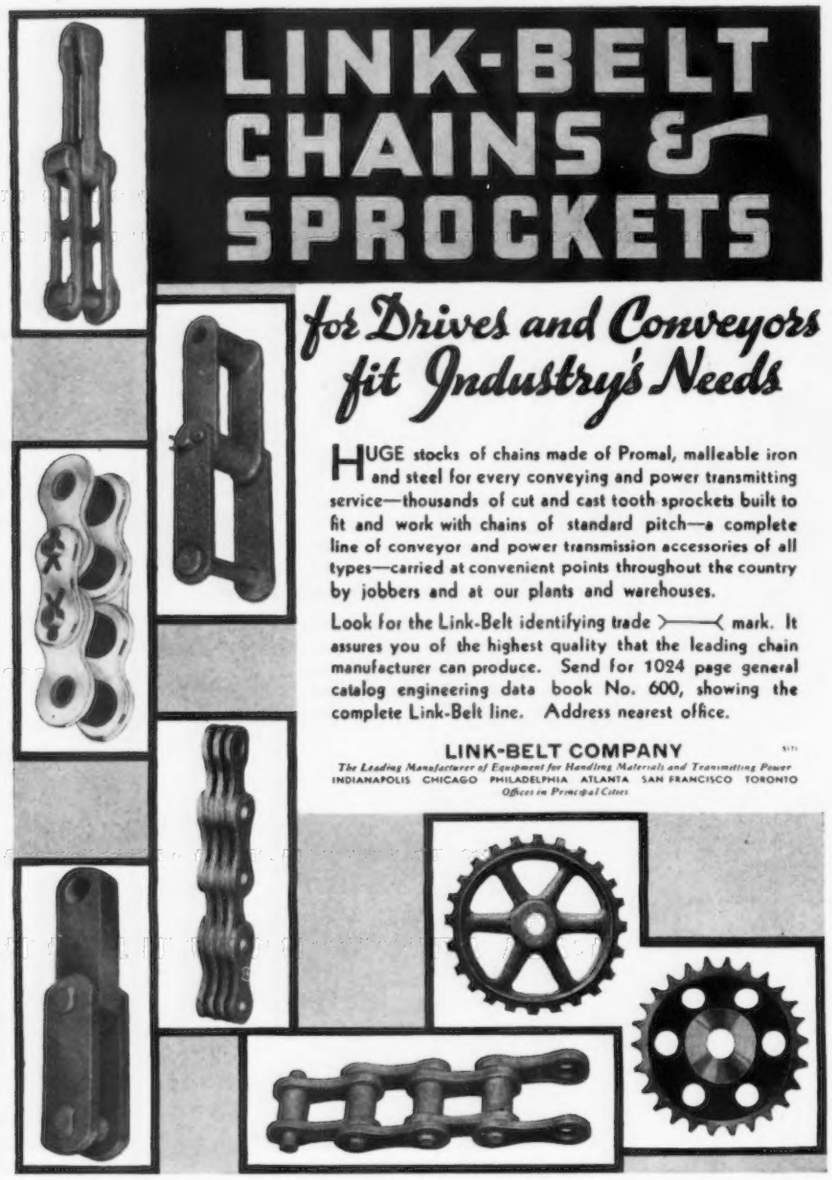
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gun-boring lathe, one precision boring machine, one universal circular table (Circular 28); one shaper, one tilting arbor saw, three milling machines, one set of attachments for milling machines, three pedestal grinders, three electric welders, one hand jointer, one pipe-threading machine, one drill table and vise, one piston grinder, two valve refacers, one valve-seat reamer set, two connecting-rod aligners and straighteners, five lathes, six portable electric drills, three gas-electric generator sets, three garage presses (Circular 29).

General Purchasing Officer, Panama Canal, Washington, asks bids until March 12 for steel machine bolts, brass nuts, steel nuts, steel rivets, 10,000 lb. steel-wire roofing nails, pipe fittings, malleable iron unions, gate valves, copper cable and other equipment (Schedule 3034).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 15 for corrosion-resisting steel forgings for Eastern and Western yards (Schedule 4430).

SOUTH CENTRAL

Universal Atlas Cement Co., 208 South La Salle Street, Chicago, plans remodeling branch mill at Leeds, Ala., and installation of new equipment. Cost over $200,000 with machinery. S. J. Robinson, Chicago address noted, is assistant chief engineer in charge.

Old Kentucky Distillery, Inc., Columbia Building, Louisville, has work under way on new plant on 15-acre tract on Dixie Highway, for which general contract was recently let. Cost about $180,000 with equipment. E. A. Moldenhauer is in charge of construction. Edgar W. Archer, Coleman Building, is architect.

Oertel Co., 1400 Story Street, Louisville, has let general contract to O. M. Ryser, 1744 Wilson Avenue, for one-story addition, 40 x 70 ft., to brewery, for bottling works. Edgar W. Archer, Coleman Building, is architect.

United Carbon Co., 350 Fifth Avenue, New York, has purchased natural gas and carbon black properties of Century Carbon Co. near Monroe and Richland, La. New owner plans expansion and development, including pipe lines, storage and distributing facilities, etc.

Coca Cola Bottling Co., Montgomery, Ala., will soon take bids on general contract for new two-story mechanical bottling plant at Tuscaloosa, Ala., 75 x 150 ft. Cost about $40,000 with equipment. Carl B. Cooper, Bell Building, Montgomery, is architect.

MICHIGAN DISTRICT

Chrysler Corpn., Detroit, has let general contract to Truscon Steel Co., 615 Wayne Street, for one-story addition to plant on East Jefferson Avenue, primarily for storage and distribution. Cost close to $30,000 with equipment.

Poppitz & Melchers, Inc., Detroit, care of Mildner & Eisen, Hammond Building, architects, recently organized to erect a brewery at foot of Dubois Avenue, has plans for new multi-story unit and smaller structures, for which bids will be asked soon on general contract. Cost over $100,000 with equipment. Company is disposing of stock issue to total over $600,000 for project.

White Electric & Mfg. Co., 632 Clifford Street, Lansing, Mich., has been organized by Clay Campbell, Olds Tower Building, and associates, to manufacture electric water heaters and kindred products.

United States Engineer Office, Detroit, asks bids until March 12 for 32 1-in. hydraulic wedge gate valves (Circular 35).

Norge Corpn., 670 East Woodbridge Avenue, Detroit, manufacturer of electric refrigerators, parts, etc., has let general contract to Strom Construction Co., Muskegon, Mich., for new steam power house at factory at Muskegon Heights, to replace plant recently destroyed by fire. Cost close to $50,000 with equipment.

PACIFIC COAST

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 15 for flame-proof cable (Schedule 4419) for Puget Sound Navy Yard; until March 19, 1-qt. capacity oil fillers (Schedule 4455) for Mare Island and Puget Sound yards; until March 22, 26,500 doz. hacksaw blades (Schedule 4458) for Mare Island yard.

Libby, McNeil & Libby, 60 California Street, San Francisco, food canners and meat packers, have let general contract to Austin Co., Seattle, for new branch plant at Walla Walla, Wash., consisting of two one-story units for processing and canning, and storage and distribution, 100 x 160 ft., and 100 x 100 ft. respectively, with power house and other structures. Cost close to $200,000 with machinery. Company headquarters are at Chicago.

Placerville Fruit Growers' Association, Placerville, Cal., plans new precooling and cold storage plant, including improvements in packing and loading plants. Cost about $200,000 with machinery.

Petrol Corpn., 4020 Bandini Boulevard, Los Angeles, has let general contract to Hoagland Engineering & Construction Co., 259 Granada Avenue, Long Beach, Cal., for new bulk oil storage and distributing terminal at Berth 198, Los Angeles Harbor, with pumping station, steel tanks of 85,000 bbl. capacity and other equipment. Cost about $100,000 with equipment.

Bureau of Reclamation, Denver, asks bids until March 20 for three motor-driven, double-drum radial gate hoists, three 18 x 17-ft. radial gates, two 3 ft. 3 in. x 3 ft. 3-in. high pressure gates, etc., for spillway and outlet works, Agency Valley Dam, Vale Project, Ore. (Specification 616).

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Rotary Type Metal Cleaning Machines

(CONTINUED FROM PAGE 25)

7½-hp. constant-speed motor unit (S) which supplies pressure for the liquids employed in work treatments. The unit is mounted upon a separate structural steel base, which bolts as a unit to the front of the machine base just above the floor level.

Pressure Hot Air Unit

Directly in back of this unit, located on the same cross-sectional center of the machine, but set in from the front housing line of the machine, is a 3-hp. constant-speed motor and pressure fan unit (T), also unit mounted. This unit is for withdrawing warm air which has circulated over the work in the drying chamber (D) and forcing it into the pressure blast chamber (Z), where its temperature is boosted by re-circulation over copper heating coils. From this pressure blast chamber, the air is again forced over the work in the drying chamber. This unit provides for regularity of hot-air circulation at 220 deg. within the drying chamber during machine operation.

The pressure blast chamber (Z) is a 4-walled, built-in unit at approximately the widthwise center and running longitudinally of the machine. It is fully inclosed except for exhaust intake, from the drying chamber, and pressure outlet, by pipe, into the end of the drying chamber. The pressure hot-air pipe extends the full length of the drum (B), is tapered, and has a tapered slot directly above the work in process. The taper effect-result is equalized hot-air blast on the work for the full length of the drum.

Sequence of Treatment

In operation with the drums revolving, the parts to be cleaned are chuted from the charging table at (G-1), either manually or by conveyor, into the upper drum (A) and as they are propelled and tumbled lengthwise of the drum by the helix member (J) and the spacers (K), they first pass under the alkali-solution sprays delivered under pressure by overhead piping (W) from the solution tank (X). This tank occupies machine space approximately 1/3 lengthwise and ¼ widthwise at one end, on the front side of the machine opposite to the drums. One side wall of the tank is the front outside housing of the machine; the other is the wall of the air pressure blast chamber (Z) which separates the tank from the drum chambers (C & D).

In the receiving end of the drum (A), the parts are hot-solution cleaned and the cleanings drain into a sliding skimmer box (U) within the base, while the liquid returns to the alkali tank (X) to be reheated by passing over heating coils within the tank. The outgoing solution is taken from the vertical center of the supply within the tank—not from the sediment-settling bottom, nor from the foamy top.

Drain-to Sewer

As parts are propelled further along within the drum (A), they pass under the drain-to-sewer sprays where they are pressure cold-washed for the removal of clinging solution and loosened refuse. The parts continue on in the drum (A) toward the end, where they are under soluble-oil sprays, overhead piping (W), for slush treatment. The soluble-oil tank (Y), in which the oil is coil-heated, is the same in size as the alkali-solution tank and holds 160 gallons. It is positioned at the opposite front end from the alkali tank. The sprayed solution returns to the tank through a straining system which provides that out-going soluble-oil solution shall be taken from the vertical center of the supply within the tank.

At this point, the extreme end of the drum (A), the parts chute themselves by gravity through chutes (G-2) and (H-1) into the end of drum (B), directly below, and are propelled and tumbled along within the longitudinal zone of the pressure hot-air blast which is piped as above described, from the pressure chamber (Z). The pressure-blast pipe is admitted through the extreme discharge end of the drum (B). It shoots hot air through its bottom tapered-slot along the entire length of the pipe and drum. The parts are actually rolling and tumbling constantly (head on) into this blast as

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they progress to the discharge end.

When the parts reach this discharge end, they have received their prescribed treatment and by gravity, chute themselves into tote boxes or receptacles placed within a floor space provided for them. This space is under the machine and within its wall lines.

Equipment Detail

All spray pipes are equipped with Metalwash patented adjustable nozzles, brass brazed. Liquid heights are float-controlled.

Liquid heats are thermostatically-controlled.

The lower drum is removable by taking out four thumb screws in each of the two panel housings (E), lifting the panels out and rolling the drum from the housing.

The upper drum is likewise easily removed by lifting the top-housing member as illustrated, and lifting the drum from its resting position.

The simplicity of panels removal provides extreme accessibility to all parts of the machine.

New Spiral-Bevel Pinion Rougher With Automatic Work Cycle

(CONCLUDED FROM PAGE 26)

in-and-out feed of the work-head, to permit periodic indexing and the withdrawal movements for dechucking, are effected hydraulically. The completion of one of these movements trips the other. The feed mechanism operates directly behind the pinion being cut, and approximately in line with the point of cutting, for obtaining a smooth and steady feed. The rapid return of the feed is at constant speed regardless of the feed rate. Hydraulic parts are so arranged that any leakage is directed back to the sump.

Automatic Withdrawal

An automatic feature provides that as the last tooth is cut, the work-head is withdrawn at full speed to the chucking position. A single lever is used to dechuck. A power-stripper mechanism loosens the cut pinion for removal. Mechanical safety devices and interlocks are employed throughout the machine. Lubrication is entirely automatic. Coolant tank capacity is 40 gal. The chip compartment is easily accessible. Both the coolant and hydraulic pump are driven by one 1200 r.p.m. motor which is separate from the 1800 r.p.m. cutter motor. These two motors with two controllers and a relay-switch, a "plugger" switch for stopping the cutter motor from coasting, and one limit-switch, comprise the electrical equipment, all of which is built into the machine. Fixed piping is largely used throughout the hydraulic system.

After a pinion is placed in the spindle, the chucking lever is manually operated to clamp the work and bring an arm forward, which in turn brings the outboard support arm in engagement with the pinion and also starts the cutter motor.

Automatic Cycle

The automatic cycle of the machine is started by tripping another lever which starts the down-roll and index. After the bottom of the roll is reached, the blank feeds in rapidly until it engages the cutter, after which the feed rate slows down. The rate of feed and the point at which it trips-in are adjustable mechanically and actuated hydraulically.

When the work has been fed to the full depth of the up-roll, the generation is started. The roll rate is uniform for approximately the first half of the roll. By the time the center of the roll is reached, most of the stock has been removed and the roll rate is gradually increased from this point to the end of the roll. When the end of the generating roll is reached, the feed cylinder trips, withdrawing the work sufficiently to clear the cutting blades on the down-roll. The indexing is operated by the down-roll motion. The return, down-roll and the first portion of the in-feed are at a constant rate. At the end of the up-roll on the last tooth, the work-head backs out automatically to the chucking position. The chucking lever may then be manually operated to release the pinion and stop the cutter; the outboard support arm moves out of the way and the pinion is loosened in the chuck. The operator may then remove the pinion and reload.